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Corrosion-Control (CC) Program: SIMA Puget Sound

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EXECUTIVE SUMMARY

In the course of Integrated Systems Analysts, Inc.'s (ISA's), support for the Corrosion-Control (CC) Program under the direction of Commander, Naval Surface Force, U.S. Pacific Fleet (COMNAVSURFPAC), Code N4I, this interim technical information report is provided to discuss the current status of the work in progress for Shore Intermediate Maintenance Activity, Puget Sound (SIMA(PS)), with respect to Delivery Order No. 0009. The scope of this Delivery Order included the following:

- Provide engineering support for Industrial Plant Equipment (IPE) review for CC production shop at SIMA(PS) and make recommendations for improvements.
- Provide engineering, technical support and training for production CC shop facilities at SIMA(PS) in accordance with plans established during the development and operation of the SIMA San Diego(SD) Pilot CC Shop.
- Provide technical support to analyze and evaluate the CC Training Program developed for the production CC Shop Program and analyze and evaluate CC Technician certification processes.
- Provide engineering and technical support at SIMA(PS) to establish and operate a production CC shop to ensure that the development and operation complies with plans established during the development and operation of the SIMA(SD) Pilot CC Shop.
- Provide continuing engineering and technical support to the SIMA(PS) CC Shop to evaluate ship-to-shop work-package implementation, shop production efficiencies and work complete documentation.

The SIMA(PS) CC Shop is scheduled for beneficial occupancy in Fiscal Year 1992 and the CC Shop design is still in the initial stages. Many planning factors have yet to be defined by COMNAVSURFPAC and Naval Sea Systems Command (NAVSEA), and therefore much of the work performed is in the form of recommendations.

This work performed under this Delivery Order during the period of 22 April 1987 through 30 September 1987 is summarized in the following paragraphs.

- **Industrial Plant Equipment Review** - Recommendations for IPE design have been provided based upon our experience at the established CC shops. NAVSEA has yet to submit procurement requests specifying the IPE to be procured, and it is recommended that ISA be involved in the preparation and review of these IPE procurement specifications to be prepared by NAVSEA in order to ensure that lessons learned are incorporated. Once the IPE is designated, ISA will assist in obtaining

the operating permits. ISA will also develop an IPE PMS and EOSS to be implemented by COMNAVSURFPAC prior to shop operation using the validated SIMA(PH) systems as guidelines.

A preliminary listing of minor expense equipment (MEE) has also been developed and provided. It is recommended that the list of MEE to be procured be reviewed by ISA prior to submission for procurement in order to ensure suitability.

- **Training Support** - Since the SIMA(PS) CC Shop is scheduled for beneficial occupancy in Fiscal Year 1992, training has not been conducted to date. Currently, two training courses have been developed by ISA and will be validated at SIMA(PH) in Fiscal Year 1988. These courses and materials must be provided for SIMA(PS) CC Shop personnel and Ship's Force personnel as discussed herein.
- **Engineering and Technical Support for CC Shop Establishment** - A preliminary list of CC Shop consumables was developed and is provided. ISA will perform further analysis during the year prior to CC Shop operation in order to review and revise this list based upon refined production requirements and changes in local sources and standard Navy stock system supplies.

Preliminary process instructions for wire-sprayed aluminum and powder coating were developed and are also provided. ISA will review and revise these process instructions accordingly to ensure compliance with NAVSEA policy at the time of shop initial operation.

- **Work Package Implementation and Documentation** - A Ship Class Master Job Catalog for CC work is currently being developed and evaluated as a method of CC Work Package definition and implementation. CC Work Package Guides are also being developed for ships homeported at San Diego and Pearl Harbor which define CC work package candidate work and procedures to implement and document CC work. ISA will prepare CC Work Package Guides for all ships to be homeported at Puget Sound as they are designated.

This report contains details of the SIMA(PS) current CC Shop status, support provided to date, recommendations regarding shop implementation and appendices presenting the documents developed.

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1.0 INTRODUCTION

The Commander, Naval Surface Force, U.S. Pacific Fleet (COMNAVSURFPAC) has a continuing program to reduce nonproductive Ship's Force (S/F) labor and redirecting S/F labor to readiness training and to enhanced equipment system maintenance. Shipboard corrosion has historically been a major source of repetitive maintenance, repetitive in the sense that the paint and preservations have a short service life which results in frequent reapplication and topcoating.

1.1 BACKGROUND

In 1983, a Senior Navy Steering Board proposed that Type Commanders and their Shore Intermediate Maintenance Activities (SIMAs) identify requirements and develop the capability to deliver a full spectrum of corrosion-control (CC) services. The objective of the SIMA CC Shops would be to:

- Reduce the excessive S/F manhours spent on corrosion prevention and control.
- Extend the service life of shipboard components, spaces and structures by reducing marine corrosion.
- Reduce or eliminate material, labor and schedule costs involved in the repair or replacement due to corrosion.

The majority of SIMAs currently do not have the manning, equipment, industrial processes or Shop organization to provide all of the CC services as defined by Naval Sea Systems Command (NAVSEA), however, some SIMAs do have a limited capability to provide some CC work that meets the operational and technical requirements of COMNAVSURFPAC and/or NAVSEA.

Accordingly, COMNAVSURFPAC initiated a program to procure, install, train and operate production CC Shops at the COMNAVSURFPAC SIMAs. To date, CC Shops have been established at SIMA Pearl Harbor (PH) and SIMA San Diego (SD), and will be established at SIMAs Long Beach (LB), San Francisco (SF) and Puget Sound (PS).

1.2 SCOPE OF WORK

This report shall summarize the progress and support provided and provide recommendations. The technical support as stated within the Delivery Order was to include the following:

- Provide engineering support for Industrial Plant Equipment (IPE) review for CC production Shop at SIMA(PS) and make recommendations for improvements.
- Provide engineering, technical support and training for production CC Shop facilities at SIMA(PS) in accordance with plans established during the development and operation of the SIMA(SD) Pilot CC Shop.

- Provide technical support to analyze and evaluate the CC Training Program developed for the production CC Shop program and analyze and evaluate CC technician certification processes.
- Provide engineering and technical support at SIMA(PS) to establish and operate a production CC Shop to ensure that the development and operation complies with plans established during the development and operation of the SIMA(SD) Pilot CC Shop.
- Provide continuing engineering and technical support to the SIMA(PS) CC Shop to evaluate ship-to-shop work-package implementation, shop production efficiencies and work-completed documentation.

2.0 SIMA PUGET SOUND

2.1 GENERAL

Currently, there are five Naval facilities in the Seattle area, however, only one is involved in surface ship repair support. This facility, Puget Sound Naval Shipyard, does have the capability to apply wire-sprayed aluminum (WSA) and paint, however powder coating services and technical assistance for the other 12 NAVSEA-approved CC Systems are not available.

The new SIMA(PS) building which will house the CC Shop is being developed under Military Construction (MCON) Project P-045 at Everett, WA. The Plan of Action and Milestones (POA&M) for P-045 is shown in Figure 2-1 with the beneficial occupancy presently scheduled for early Fiscal Year 1992. The location of SIMA(PS) and P-045 is shown in Figures 2-2 and 2-3.

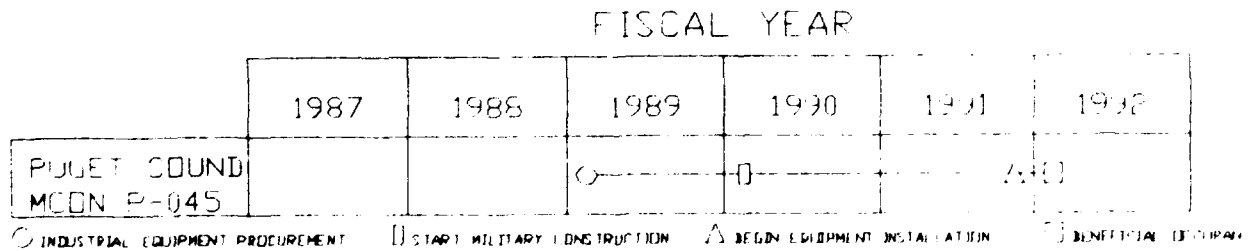


Figure 2-1 MCON P-045 POA&M

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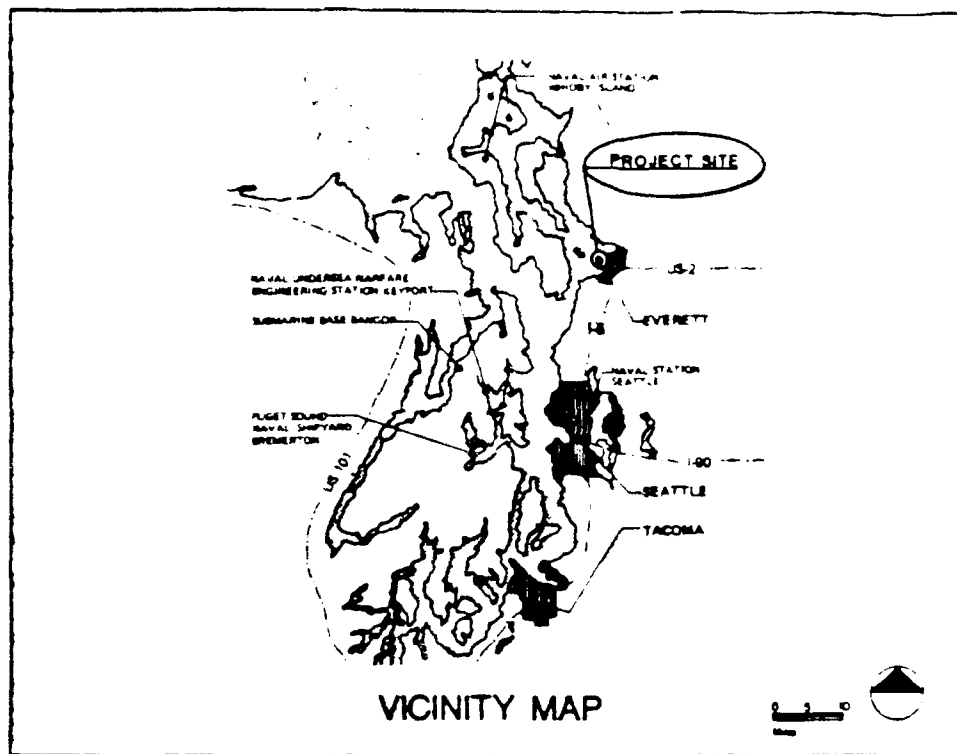


Figure 2-2 Puget Sound Vicinity Map

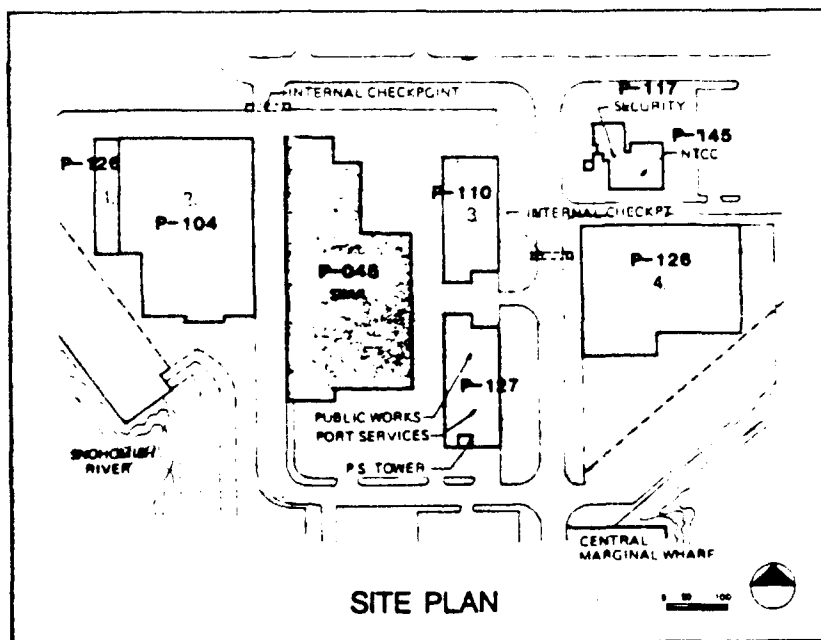


Figure 2-3 MCON Project P-045

2.2 MILITARY CONSTRUCTION (MCON) PROJECT P-045

The main floor of P-045 is approximately 102,500 square feet. The major shops to be enclosed within this building as shown in Figure 2-4 are:

- Shipfitter Shop
- Sheetmetal Shop
- Welding Shop
- Pipe/Boiler Shop
- Outside Machine Shop
- Inside Machine Shop
- Pump Shop
- Electrical Repair Shop
- Valve/Regulator Shop
- Gas Turbine Shop
- Boat Repair Shop
- Foundry
- Rigger's Shop
- Sail Loft and Canvas Shop
- Corrosion Control Shop

2.3 PUGET SOUND PORT LOADING

Currently, there are seven ships homeported in the Puget Sound area. It is planned to move a battle group into the area with a total port loading of 17 ships in Fiscal Year 1990. This increase, however, may be postponed in order to coincide with the completion of the SIMA which has a planned beneficial occupancy in Fiscal Year 1992.

Table 3-1

SIMA(PS) CC Shop Proposed Services

CC SYSTEM	NAVSEA-APPROVED SYSTEMS	METHOD OF DELIVERY
1	Wire-Sprayed Aluminum (WSA) (10-15 mils) + 2-coats DoD-P-24555 heat-resistant aluminum paint (3 mils DFT)	Shop Production
2	Wire-Sprayed Aluminum (WSA) (7-10 mils) + 5-part sealer/barrier-topcoat epoxy-polyamide, silicone-alkyd paint schedule (9.5-9.75 mils DFT)	Shop Production
3	Paint Coating Systems specified in NSTM 631	Shop Production (to WSA items)
4	Electrostatic-Sprayed Powder (ESP)	Shop Production
5	Non-Skid Deck Coating (flush deck scuttles and hatches)	Technical Advice
6	Ceramic-Coated Fasteners	Material Support
7	Water-Displacing, Clear, Corrosion-Prevention Compound	Material Support
8	Anti-Seize Thread Compound	Material Support
9	Corrosion-Resistant (CRES) 316 Fasteners	Material Support
10	Sealing and Coating Compound	Material Support
11	Polysulfide Sealant	Material Support
12	Multi-Fin Connection Protection	Technical Advice
13	Dielectric Barriers (Polyvinyl, Glass-Reinforced Insulation Gaskets and Nylon Washers)	Technical Advice and Material Support
14	Vapor-Phase Inhibitor	Technical Advice
15	Strippable Coating	Technical Advice

3.0 SIMA(PS) CC SHOP

3.1 GENERAL

The CC Shop at SIMA(PS) will consist of approximately 7,392 square feet of enclosed floor space on the northeast end of the production area of the new SIMA Building being constructed under MCON Project P-045. The 35% design drawings were submitted for review in December 1986. ISA reviewed the CC Shop design and provided comments to COMNAVSURFPAC. Our preliminary study indicated that the CC Shop capacity should be sufficient to serve the 17 ships anticipated to be homeported at Puget Sound in addition to the shop-to-shop work expected. The Shop's proposed services shall include the capability to provide application and/or technical support for the NAVSEA-approved systems as listed in Table 3-1.

3.2 CC SHOP LAYOUT

The original CC Shop layout as proposed in the 35% design drawings is shown in Figure 3-1. In order to provide greater efficiency, ISA submitted the layout shown in Figure 3-2 to COMNAVSURFPAC. This recommended layout provides more efficient material handling, improved utilization of floor space and two additional blast units.

The minimum power required by the recommended CC Shop IPE, as shown in Figure 3-2, is approximately 600A at 480V. The power presently provided at Panel DP2, which supplies the entire north end of the building with the exception of the compressors and low-bay shops, is 800A at 480V. Also, a minimum of approximately 800 cfm of compressed air is required for the recommended IPE operation in addition to miscellaneous utility air outlets required for intermittent usage. Should the recommended IPE be installed, the electrical power system and compressed air system may need to be revised.

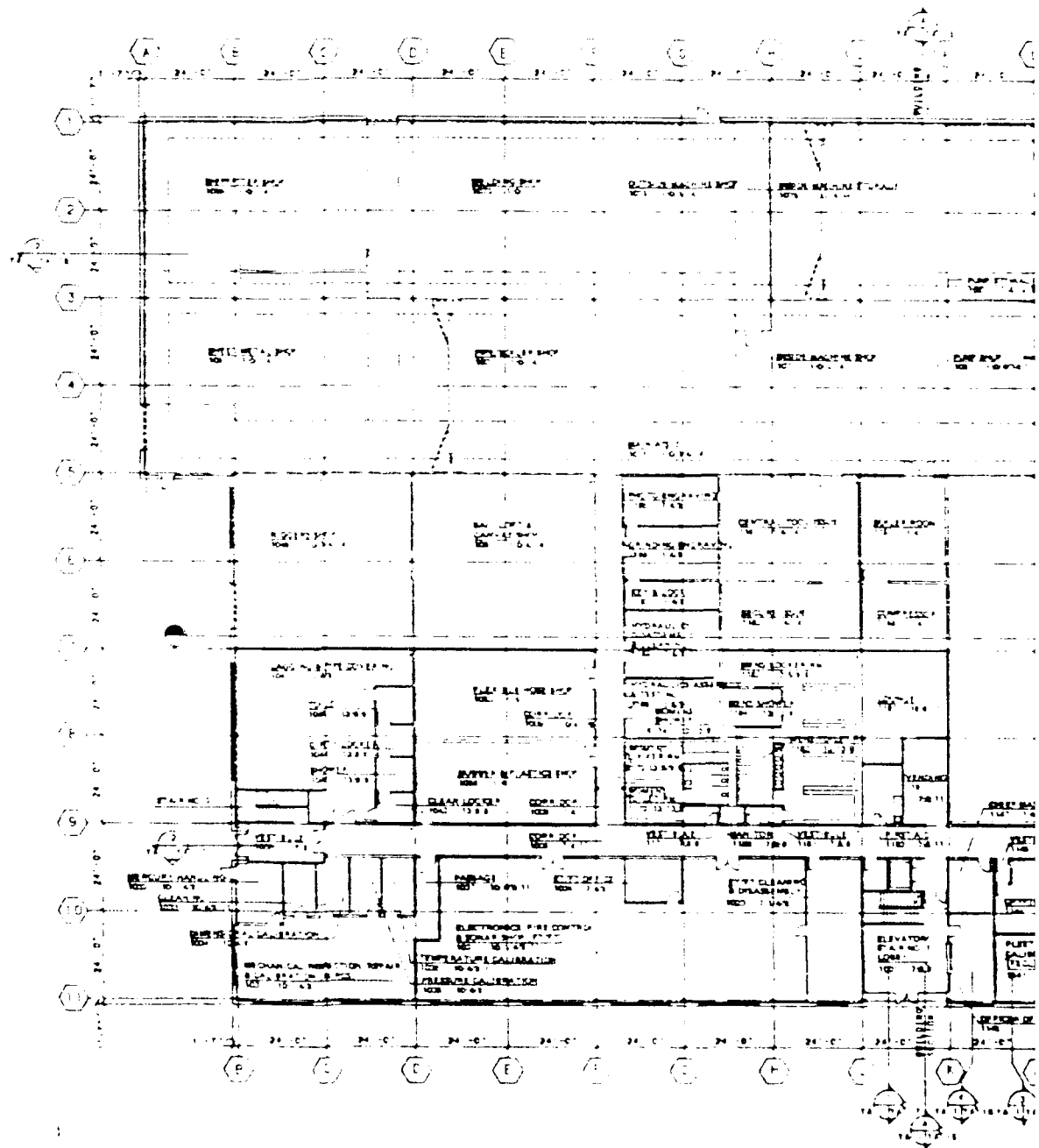
3.3 EQUIPMENT

3.3.1 Industrial Plant Equipment (IPE)

The IPE previously recommended for the SIMA(PS) CC Shop includes the following:

- Vapor Degreaser (8'x4'x4')
- Abrasive Blast Booths (four total) (10'x20'x10')
- Reach-in Blast Cabinets (two total)
- WSA Waterwash Booth (15' minimum)
- Metallizing Systems (two total)
- Paint Waterwash Booth (15' minimum)
- Powder Spray Booth
- Powder Curing Oven
- Air Compressor

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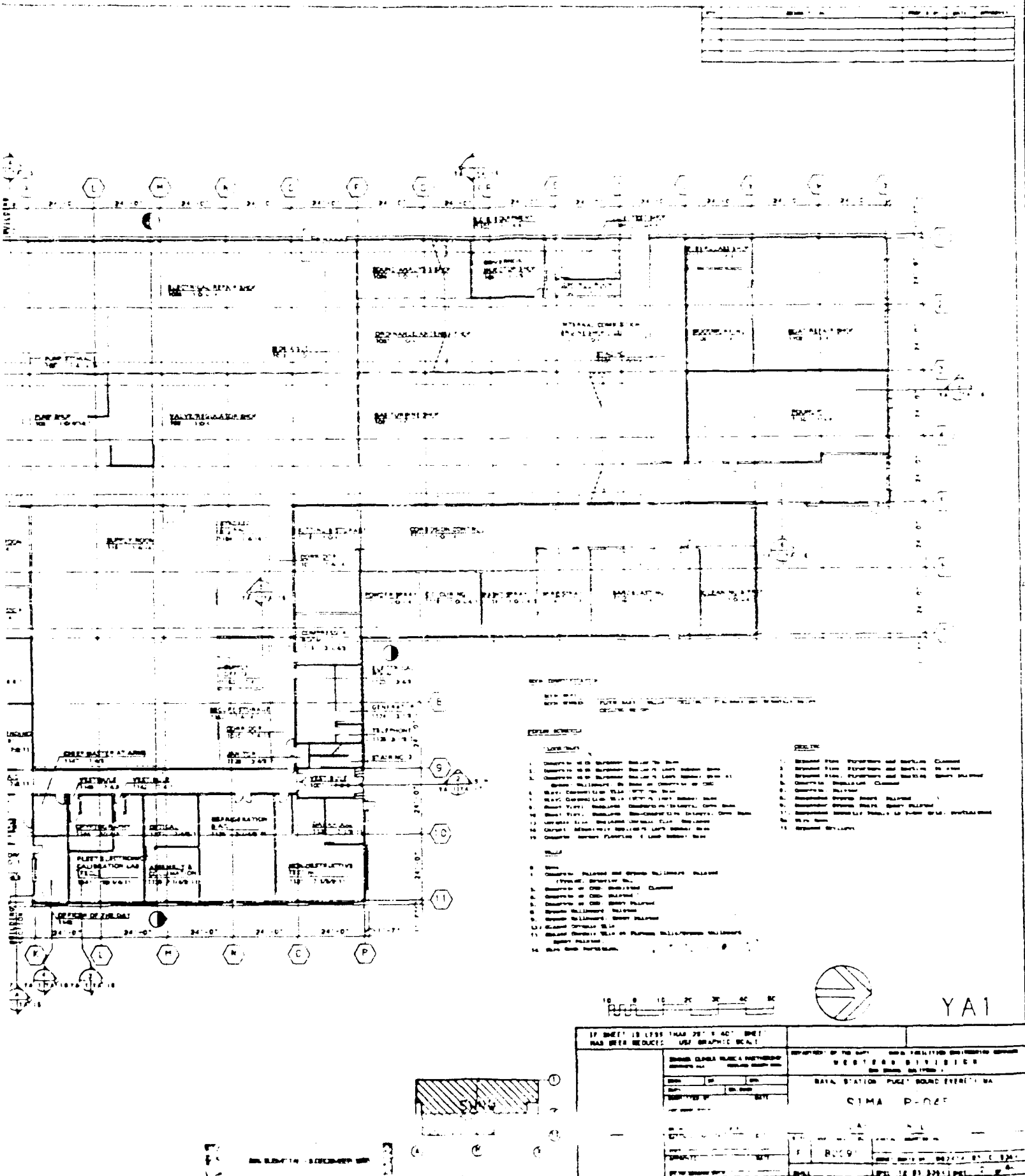


Figure 2-4

MCON P-045 Building Layout

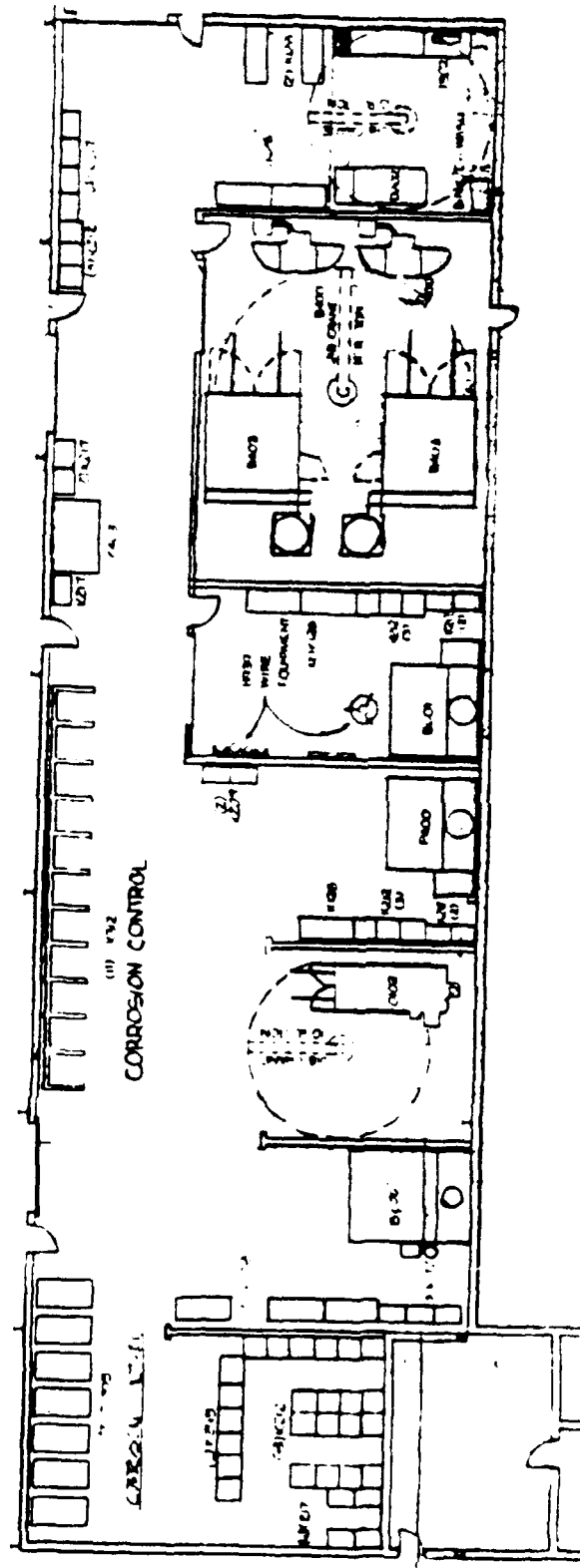
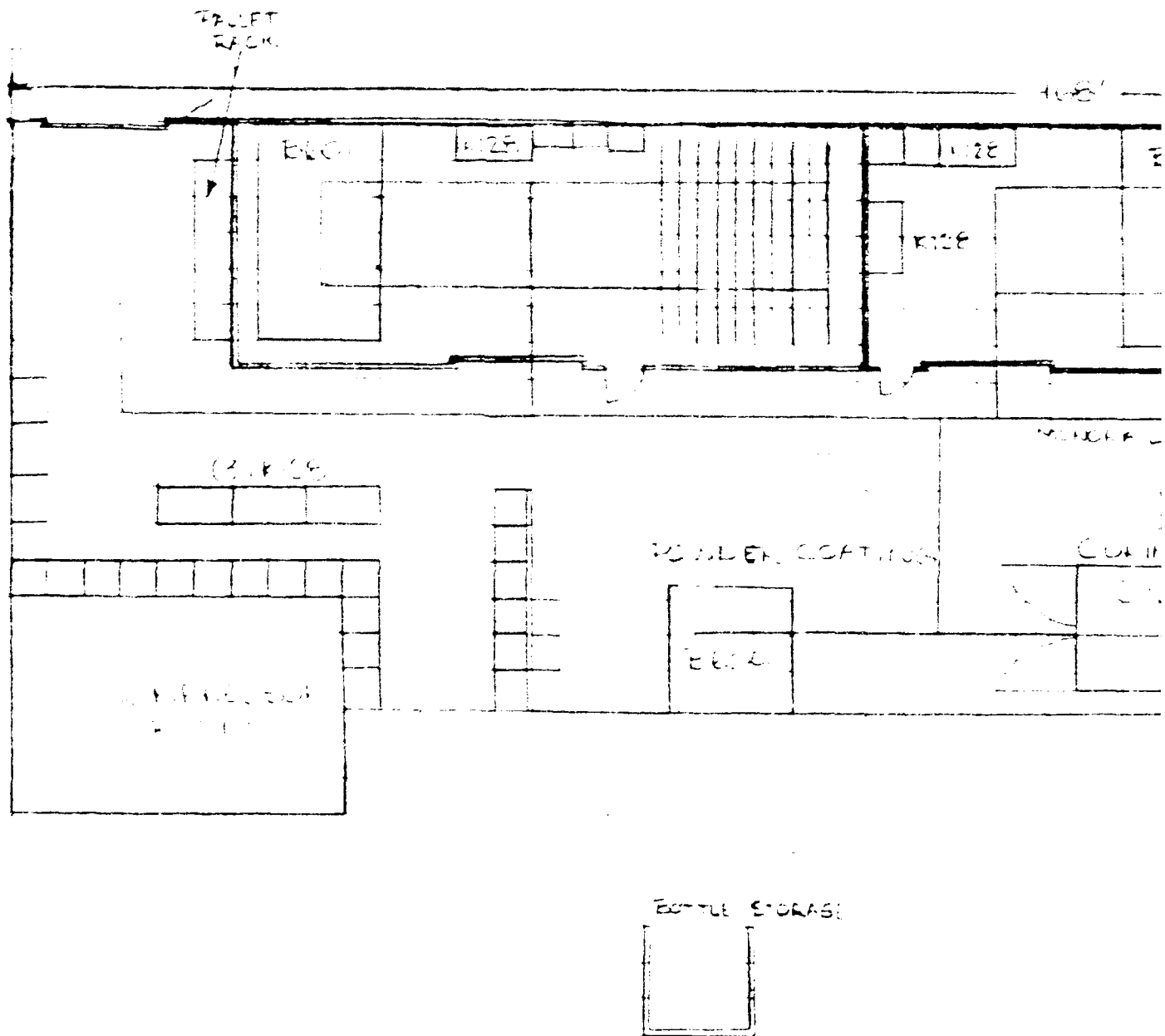


Figure 3-1 Original SIMA(PS) CC Shop Layout



The Vapor Degreaser should be similar to Randall Mfg. Company Model V96EX which is the model procured for the SIMA(PH) CC Shop. This degreaser must be procured with a closed cooling-water system as discussed in References 3a and 3b in order to comply with current Naval conservation policies.

Abrasive Blast Booths are recommended to include air-swept floors. Preferable dimension are 10'x20'x10' and, if feasible, the blast pots should be located external to the building for easy truck access.

The Reach-In Blast Cabinets should be the pressure type rather than suction and should be similar to CLEMCO Silverado Model 4050.

Both the WSA and Paint Waterwash Booths should be a minimum of 15' long. Fire protection regulations specify that the booths must be equipped with sprinklers in the spray, plenum and stack areas. The Paint Waterwash Booth is recommended to be manufacturer's standard, however, the frontal air velocity of the WSA Waterwash Booth must be a minimum of 200 fpm.

It is strongly recommended that the Navy install the same type of Powder Spray Booth utilized in the SIMA(SD) Pilot Powder Coating Station Service Test (Ref. 3c). The booth utilized had a set of cyclicly-cleaned primary filter cartridges and a set of final absolute filters. This dry-filter cartridge booth with cyclic air backflushing performed with no pollution, safety or maintenance problems. Booths can be designed with either timed purges or plenum-pressure signaled purges. The final absolute filters remove enough powder from the final exhaust air that the booth may be exhausted into the workspace. This saves in ductwork, building heating costs and nuisance pollution problems.

The Powder Curing Oven should be similar to that recently installed at SIMA(PH). This oven is a special walk-in oven manufactured by the Grieve Corporation for the U.S. Government, purchased under Contract N00600-86-C-1510. A fume-exhaust system is not required for powder coating, but will be necessary if the oven is to be used for degreasing porous castings.

The air compressor procured for the SIMA(PH) CC Shop is an Ingersoll-Rand SSR EP200. This compressor or equivalent is recommended for the SIMA(PS) CC Shop.

It is recommended that ISA be involved in the preparation and review of the IPE procurement specifications in order to ensure the incorporation of lessons learned from established CC shops.

3.3.2 Minor Expense Equipment (MEE)

The SIMA(SD) CC Shop MEE list is provided in Appendix A. At this time, this equipment is recommended for SIMA(PS) with the following exceptions:

- A Randsburg-Gema electrostatic powder-coating system, Type 701, should be added for complex-geometry component coating.
- Item #0018, Hoist, Electric w/Trolley 1TN, 10-ft lift should be modified to provide a minimum 16-ft lift.
- Item #0007, Crane, Floor, Mobile Hydraulic should be deleted due to infrequent requirements.
- Item #0010, Gage Pull-off, for Dry Film should be deleted.
- Item #0009, Gage, Digital Dry Film should be replaced with two Nordson Corp. Model DFG-E2 gages.
- Item #0011, Printer for Digital Dry Film Gage should be deleted.

Prior to the MEE procurement for SIMA(PS), it is recommended that ISA review the list to ensure suitability and to incorporate new instruments and special requirements that exist at that time.

3.3.3 EPA Operating Permits

Most of the recommended IPE will require operating permits. Due to ever-changing pollution regulations and uncertain IPE specifications, it is too early to begin researching permit requirements at this time. It is recommended that upon designation of the IPE, ISA assist in coordinating the application for permits and review special exhaust requirements as stipulated by the local pollution control organization and Department of Health.

3.3.4 IPE Planned Maintenance System (PMS)

The establishment of a CC Shop at a SIMA requires the installation of IPE unique for the application of CC coatings. The uniqueness of this IPE to a CC Shop presents a maintenance problem to SIMA personnel in that the equipment is new and unfamiliar to the maintenance personnel. In order to reduce unnecessary equipment downtime directly related to poor preventive maintenance and improper equipment operation, a CC-Shop PMS and Equipment Operating and Sequencing System (EOSS) are being developed for the equipment being installed at SIMA(PH). This CC-Shop PMS and EOSS is scheduled for validation during the SIMA(PH) start-up training scheduled for October 1987.

In that the IPE procurement has not begun for SIMA(PS), the PMS and EOSS developed for Pearl Harbor may be directly applicable to the SIMA(PS) CC Shop. It is recommended that a PMS and EOSS for SIMA(PS) be developed as the IPE manufacturers are designated using the validated SIMA(PH) systems as a baseline.

3.4 CC SHOP CONSUMABLES

A preliminary list of CC Shop consumables is given in Appendix B. The appendix presents items, such as paint, powder, wire, masking tape, safety clothing and equipment, abrasive grit, etc., with the National Stock Number or potential open purchase sources. The appendix also presents the necessary fastener requirements for fasteners not commonly available in the Navy Supply System. The fasteners are presented in sample requisition documents (Form DD-1149).

The quantities listed and usage rates are based upon our study and analyses of the projected Puget Sound port loading for Fiscal Year 1992 and on lessons learned in the SIMA(SD) Pilot CC Shop Service Test (Ref. 3d). It is recommended that ISA monitor the consumable usage of SIMA(PH) during the next year. SIMA(PH) has a similar port loading and IPE which should result in a high correlation between the consumption rates of these two CC Shops. As the SIMA(PS) CC Shop operation nears, it is recommended that ISA analyze the correlation between SIMA(PS) and SIMA(PH), review the port deployment schedules and availability policies, actual IPE and manning of the SIMA(PS) CC Shop, investigate NSN consumables, local open-purchase sources and procurement specifications required and revise this consumable list accordingly.

3.5 CC SHOP MANNING

At this time, there is insufficient information available to specify the CC Shop manning requirements. It is recommended that ISA study the ship deployment schedules, availability policies, shop-to-shop work produced, the IPE to be installed and the manning requirements of CC Shops in operation with similar conditions and provide manning recommendations to COMNAVSURFPAC for billet requests as soon as ships are designated to be homeported at Puget Sound.

3.6 TRAINING

3.6.1 CC-Shop Technician Training Course

The CC-Shop Technician Training Course Instructor Guide was developed by ISA and reviewed by NAVSEA, as reported by Reference 3e. This course was needed for CC Shop personnel because of their inexperience in the aspects of marine corrosion, NAVSEA's approved CC methods and processes and the equipment associated with the application of these CC systems. The objective of this training program was to enable CC Shop personnel to apply the CC coatings, to provide CC technical assistance to other SIMA Shops and tended ships and to become certified in accordance with the standards governing the CC system application. In addition to the Instructor Guide of the CC-Shop Technician Training Course, COMNAVSURFPAC N4I recognized the requirement that a Student Workbook is required. The Student Workbook will provide the student with a place to take notes and serve as a ready reference for use after the course is completed. This Student Workbook has been developed as reported by Reference 3f and has been incorporated into the CC-Shop Technician Training Course.

The initial CC Shop personnel to receive the CC-Shop Technician Training Course shall be the SIMA(PH) Technicians in October 1987. The validation of the CC Shop Technician Training Course shall occur during this training and all changes to the course developed during the SIMA(PH) training shall be incorporated and published by March 1988. It is recommended that the validated CC-Shop Technician Training Course be conducted at SIMA(PS) prior to CC-Shop operation once the IPE is installed.

3.6.2 CC Shipboard Training Course

In addition, COMNAVSURFPAC N4I recognized the importance of training S/F personnel in the use of the CC systems, repair of the CC coatings and proper installation of the coated equipments aboard the ship. The CC Shipboard Training Course has been developed as reported by Reference 3f. The validation of the CC Shipboard Training Program shall occur during the first quarter of Fiscal Year 1988 onboard ships homeported in Pearl Harbor and San Diego. The validated CC Shipboard Training Course shall be published by March 1988. It is recommended that the validated CC Shipboard Training Course be provided to S/F personnel at Puget Sound prior to each ship receiving CC services.

3.7 PROCESS INSTRUCTIONS

3.7.1 Draft SIMA(PS) WSA Process Instruction

As required by paragraph 5.3.1 of Reference 3g, a naval activity must submit a written procedure to be utilized in the application of WSA at that activity for approval prior to WSA application. Appendix C is the preliminary process instruction recommended to be utilized by SIMA(PS) for WSA application. Appendix C has been developed based upon IPE similar to SIMA(PH). It is recommended this process instruction be reviewed and revised by ISA in Fiscal Year 1991 for compliance with NAVSEA policy prior to submittal to NAVSEA for approval.

3.7.2 Draft SIMA(PS) Powder-Coating Process Instruction

Although no U.S. Navy or DoD Standard currently exists for the application of powder coatings on shipboard components, a Draft Powder-Coating Process Instruction has been developed for the SIMA(PS) CC facility. Appendix D is the Draft Process Instruction for powder-coating application at SIMA(PS) developed by ISA. It is recommended this process instruction be reviewed and revised by ISA in Fiscal Year 1991 for compliance with NAVSEA policy prior to submittal to NAVSEA for approval.

3.8 CC WORK PACKAGE IMPLEMENTATION AND DOCUMENTATION

ISA is currently developing and analyzing the use of Ship Class Master Job Catalogs (MJC) for CC Work Package implementation. CC work is suitable for a MJC in that (1) equipments are common to ships of a class; (2) most equipments have quantities exceeding 50; (3) each equipment receives the same recommendation regarding CC coating and installation kit.

A draft CC MJC has been developed for the AO 177 Ship Class. This MJC will be utilized by the USS WILLAMETTE (AO 178) in January 1988, and closely monitored by ISA. Based upon the success of the AO 177 Class MJC, MJCs will be recommended to be developed for all other ship classes, and should these MJCs come into realization, it is recommended that they be utilized at SIMA(PS) for CC Work Package implementation.

ISA has also been assisting CC availability planning by developing CC Work Package Guides for Pacific Fleet ships. Each Work Package Guide discusses the background of the CC program, explains the CC availability procedures, provides Installation Kit Technical Data Sheets, contains a detailed list of all topside shipboard components recommended for CC services and provides a method of documenting CC work completed. Work Package Guides have been developed for ships serviced in SIMA(SD) and SIMA(PH). It is recommended that Work Package Guides be developed for ships to be serviced at SIMA(PS) prior to entering into CC availabilities for CC Work Package planning and documentation.

4.0 SUMMARY AND RECOMMENDATIONS

Based upon our study of the SIMA(PS) CC Shop requirements, the description of support provided and the recommendations for implementing a full-production CC Shop at SIMA(PS) are summarized as follows.

4.1 EQUIPMENT

4.1.1 IPE

The recommended specifications for previously-recommended CC Shop IPE are as follows.

- **Vapor Degreaser** - The vapor degreaser should be similar to Randal Mfg. Company Model V96EX and must have a closed cooling-water system.
- **Reach-In Blast Cabinets** - The blast cabinets should be similar to CLEMCO Silverado Model 4050.
- **Waterwash Booths** - The Paint Waterwash Booth should be manufacturer's standard. The WSA Waterwash Booth must have a frontal air velocity of 200 fpm. Both booths should be a minimum of 15' long and must have fire protection sprinklers in the spray, plenum and stack areas.
- **Powder Spray Booth** - The Powder Spray Booth should have a set of cyclicly-cleaned primary filter cartridges and a set of final absolute filters similar to that utilized during the SIMA(SD) Pilot Powder-Coating Station Service Test.
- **Powder Curing Oven** - The Powder Curing Oven should be a walk-in model similar to that installed at SIMA(PH).

- **Air Compressor** - The air compressor should be similar to Ingersoll-Rand SSR EP200.

These comments will be forwarded to NAVSEA 93F for consideration in the IPE specifications.

Most of the recommended IPE will require operating permits. ISA will assist SIMA(PS) in obtaining the required permits once the IPE is designated.

In order to avoid unnecessary IPE downtime due to poor equipment maintenance, it is recommended that PMS and EOSS be developed and validated for SIMA(PS) utilizing the SIMA(PH) systems as guidelines. ISA will begin this development once the IPE is designated.

4.1.2 MEE

A preliminary list of recommended MEE is provided. This list will be forwarded to NAVSEA 93F for consideration. It is recommended that the list of MEE to be procured be reviewed by ISA to ensure suitability.

4.2 CC SHOP CONSUMABLES

A preliminary list of CC Shop consumables was developed and is provided. ISA will perform further analyses to refine this list based upon production requirements, potential local sources and Naval Stock System supplies.

4.3 CC SHOP MANNING

At this time, there is insufficient information available to specify the CC Shop manning. Once the exact port loading is defined, ISA will perform further analysis of the manning requirements of established CC Shops, projected CC Shop production efficiencies and the port policies and schedules in order to provide a manning recommendation to COMNAVSURFPAC for billet requests.

4.4 TRAINING

Since the CC Shop is not scheduled for operation until Fiscal Year 1992, there has been no training provided to date for the SIMA(PS) CC Shop. There are, however, two training courses that have been developed: the CC-Shop Technician Training Course and the CC Shipboard Training Course. These courses will be validated in Fiscal Year 1988 and revised accordingly.

The validated CC-Shop Technician Training Course must be provided to the CC Shop personnel during the period between IPE installation and CC Shop operation in order to meet certification requirements as dictated by NAVSEA. The validated CC Shipboard Training Course should be provided to S/F personnel prior to a ship receiving CC services.

4.5 PROCESS INSTRUCTIONS

Preliminary process instructions for WSA and powder coating have been developed and are provided herein. These process instructions will be reviewed and revised by ISA in Fiscal Year 1991 for compliance with NAVSEA policies at that time.

4.6 CC WORK PACKAGE IMPLEMENTATION AND DOCUMENTATION

ISA is currently developing and analyzing the use of Ship Class MJC's for CC Work Package implementation. Based upon the success of the AO 177 Class MJC, MJC's will be recommended to be developed for all ship classes and utilized at SIMA/PS).

CC Work Package Guides have also been developed for Pacific Fleet ships which provide procedures and methods for implementing and documenting CC work. ISA will develop CC Work Package Guides for all ships which will be homeported at Puget Sound once they are designated.

REFERENCES

- 2a ISA Letter 5-7-320 to NAVSEA 93F, dated 23 July 1987.
- 3b ISA Letter 5-7-243 to NAVSEA 93F, dated 10 August 1987.
- 3c Schlunt, P., et.al., "Corrosion-Control (CC) Program: Pilot Powder Coating Station Service Test", ISA(WC)-ITR-108, 14 March 1986, Contract N66001-85-D-0015.
- 3d Adkins, W., et.al., "Corrosion-Control (CC) Program: SIMA Pilot CC Shop Service Test and Technical Support," ISA(WC)-107, 30 November 1986, Contract N66001-85-C-0350.
- 3e Brucker, C., et.al., "Corrosion-Control (CC) Shop Technician Training Curriculum in the SQIP Format," Revision, 15 August 1987, Contract N66001-86-D-0086.
- 3f "Corrosion-Control Program: SIMA CC Shop Instructor and Student Handbooks and Shipboard Training," ISA(WC)-122, 30 September 1987, Contract N66001-86-D-0086.
- 3g DoD-STD-2138(SH), "Metal-Sprayed Coating Systems for Corrosion Protection Aboard Naval Ships," 23 November 1981.

APPENDIX A
SIMA(SD) CC SHOP
MISCELLANEOUS EXPENSE EQUIPMENT
(MEE)

SIMA SAN DIEGO EXPENSE EQUIPMENT REQUIREMENTS

8 MAY 1987

WORK CENTER

71B - CORROSION CONTROL SHOP

REQUIREMENTS TOTAL

\$ 74,121.85

\$74,121.85

PAGE. 1

WORK-CENTER: ALL-BUYERS LIST
NOMENCLATURE
IT-NO ERN IT-ID COMMENTS

WORKING COPY ONLY:		MANUFACTURER/SOURCE (FSCM)	QTY	U/P	EXTENSION
GSA CONTRACT		MODEL/IDENTIFICATION	UNIT	LAST-DATE	
CATALOG DATA			RR		
ALLOY, SENSOR		HOWMAN CORP. (XX600)	3 EA	\$290.00	\$870.00
(0001) L-692		MB		(6150)	
DISBN 718: 3					
CABINET, STD HOUSING, MODEL 340		STANLEY VIDMAR (34004)	3 EA	\$836.95	\$2,510.85
(0002) X-452		SEP3014A-VGA-SL-ST		(6323)	
DISBN 718: 3					
CABINET, STD HOUSING, MODEL 340		STANLEY VIDMAR (34004)	8 EA	\$722.56	\$5,780.48
(0003) N-955		SEP3047A-VGA-SL-ST		(6323)	
DISBN 718: 8					
CABINET, STD HOUSING, MODEL 340		STANLEY VIDMAR (34004)	24 EA	\$649.72	\$15,593.28
(0004) L-430		SEP3110A-VGA-SL		(6323)	
DISBN 718: 24					
CABINET, STD HOUSING, MODEL 340		STANLEY VIDMAR (34004)	8 EA	\$534.24	\$4,273.92
(0005) M-783		SEP3189A-VGA-SL-ST		(6323)	
DISBN 718: 8					
CONTROL CONSOLE, MODEL NTE-CC8		NORDSON CORP. (07036)	1 EA	\$3,280.00	\$3,280.00
(0006) V-475		246152		(6045)	
DISBN 718: 1					
CRANE, FLOOR, MOBILE HYDRAULIC		MCMASTER-CARR (39428)	1 EA	\$1,016.52	\$1,016.52
(0007) L-281		323111		(5296)	
DISBN 718: 1					
FLAME EXTINGUISHER, HALON SIZE 13 TYPE D					
(0008) F950 0-021					
DISBN 718: 5					
GAGE, DIGITAL DRY FILM		ELCOMETER INC. (XX604)	5 EA	\$100.00	\$500.00
(0009) P-181		A256SFNT2E		(6188)	
DISBN 718: 1					
GAGE, PULL-OFF, FOR DRY FILM		ELCOMETER INC. (XX604)	1 EA	\$2,195.00	\$2,195.00
(0010) B-779 GAGE ACCESSORY		157		(6147)	
DISBN 718: 2					
PRINTER FOR DIGITAL DRY FILM GAGE		ELCOMETER INC. (XX604)	1 EA	\$265.00	\$265.00
(0011) M-468 GAGE ACCESSORY		HF5		(5296)	
DISBN 718: 1					
GAGE, PULL-OFF, DRY FILM		NORDSON CORP. (07036)	2 EA	\$300.00	\$600.00
(0012) V-309		DFG-B1		(7114)	
DISBN 718: 2					
GAGE, THICKNESS, MET FILM		NORDSON CORP. (07036)	5 EA	\$21.65	\$108.25
(0013) N-695		790-015		(6150)	
DISBN 718: 5					

9C-4210-01-100-9086

8 MAY 1987

SIMA SAN DIEGO EXPENSE EQUIPMENT REQUIREMENTS
PAGE. 2

WORK-CENTER: ALL-BUYERS LIST
NOMENCLATURE
IT-NO ERN IT-ID COMMENTS

		MANUFACTURER/SOURCE (FSUM)		WORKING COPY ONLY: GSA CONTRACT CATALOG DATA		QTY U/I N-D	U/P LAST-DATE	EXTENSION
		MODEL/IDENTIFICATION				RR		
GANTRY		WALLACE, B E PRODUCTS CORP (08136)						
0014	C947 Q-523	52118-515H				1 EA	\$3,495.00 (7114)	\$3,495.00
**	LSBN** 718: 1							
ST, ELECTRIC		WALLACE, B E PRODUCTS CORP (08136)						
0015	C947 G-529 GANTRY ACCESSORY	6-21-1				1 EA	\$1,090.00 (7114)	\$1,090.00
**	LSBN** 718: 1							
CAR UNIT		WALLACE, B E PRODUCTS CORP (08136)						
0016	C947 U-020 GANTRY ACCESSORY	5095-230				1 EA	\$3,800.00 (7114)	\$3,800.00
**	LSBN** 718: 1							
SLV		WALLACE, B E PRODUCTS CORP (08136)						
0017	C947 M-970 GANTRY ACCESSORY	70-202				1 EA	\$155.00 (7114)	\$155.00
**	LSBN** 718: 1							
ST, ELECTRIC W/TROLLEY 1 IN 10 FT LIFT		MCMASTER-CARR (39428)						
0018	K-992	3315W95				2 EA	\$1,136.00 (5346)	\$2,272.00
**	LSBN** 718: 2							
FEEDER, MODEL MPE-HR3		NORDSON CORP. (07036)						
0019	J-777	246941				1 EA	\$1,040.00 (6045)	\$1,040.00
**	LSBN** 718: 1							
R, PAINT 1 GAL		JIFFY MIXER CO., INC. (58685)						
0020	M-557	HS-15				1 EA	\$39.20 (6147)	\$39.20
**	LSBN** 718: 1							
R, PAINT 5 GAL		JIFFY MIXER CO., INC. (58685)						
0021	T-506	PS-21				1 EA	\$39.20 (6147)	\$39.20
**	LSBN** 718: 1							
R, AIR DRIV		CHICAGO PNEUMATIC TOOL CO. (90299)						
0022	S-743	CP7884				2 EA	\$143.00 (6147)	\$286.00
**	LSBN** 718: 2							
FR GUN, MODEL NTE-2H		NORDSON CORP. (07036)						
0023	D-949	245740				1 EA	\$1,443.00 (6045)	\$1,443.00
**	LSBN** 718: 1							
HYROMETER, ELECTRIC PORT		KAAL SCIENTIFIC INSTR. COR (XX602)						
0024	M-800	276W120				1 EA	\$175.00 (6045)	\$175.00
**	LSBN** 718: 1							
PALLET, 10'X48'X48' PER SHELF		PALK ENGINEERING COMPANY						
0025	K-115 7-007 ASSEMBLY	CONSIST OF TWO ITEMS				15 EA	\$175.00 (6045)	\$2,625.00
**	LSBN** 718: 10							
STABLE SHELF		PALK ENGINEERING COMPANY						
0026	K-115 Y-837 RACK ASSEMBLY	SERIES 1000				1 EA	\$175.00 (6045)	\$175.00
**	LSBN** 718: 1							

APPENDIX B
PRELIMINARY SIMA(PS) CC SHOP
CONSUMABLES LIST

B.0 SIMA(PS) CC SHOP CONSUMABLES

B.1 PRELIMINARY CC SHOP CONSUMABLES LIST

Consumables necessary for the daily shop processes are listed in Table B-1. This list includes masking materials, abrasive grit, paint, safety materials, powder and door and hatch fasteners. Preliminary initial stock, monthly consumption rate and national stock number or potential open purchase sources are also specified.

B.2 SAMPLE REQUISITION FORMS (DD1149) FOR FASTENERS

Large quantities of corrosion-resistant (CRES) 316 fasteners and ceramically-coated mild-steel fasteners need to be purchased for installation kits provided by the shop. None of these fasteners are currently available through the Navy Supply System. In order to assist the Supply Department, the preliminary required fastener quantities and types are provided in the form of sample DD-1149s.

Fasteners fabricated from CRES 316 may be obtained directly from a vendor, however, ceramic-coated fasteners may require a two-step procedure. First, the mild-steel fasteners must be procured, and then sent to a NAVSEA-qualified coating service firm to have the ceramic coating applied.

The DD-1149s for CRES 316 fasteners are given on pages B-8 through B-30. Mild steel fasteners are covered on pages B-31 through B-42 and the required ceramic coating on pages B-43 through B-49.

Table B-1 SIMA (PS) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
<u>STAGE 1 - RECEIVING</u>			
I.D. Tags	500	200	NSN 0116-LF-890-9020
Electrical Ties	6 pkgs	3 pkgs	NSN 5975-00-074-2072
Dog Tags	500	200	NSN 8465-00-242-4804
Shower Slips	500	200	NSN 7230-00-252-3384
<u>STAGE 2 - DEGREASING</u>			
Respirator, Charcoal Filters	25	25	NSN 4240-01-074-8390
1,1,1 Trichloroethane	375 gals	375 gals	NSN 6810-00-531-1487
1,1,1 Trichloroethane Spray Can	25	25	NSN 6810-00-930-6311
Glove (rubber), Chemical	1 pr	1 pr	NSN 8415-00-266-8675
Apron, plastic	1	1	NSN 8415-00-715-0450
Rags	50 boxes	50 boxes	NSN 7920-00-205-1711
<u>STAGE 3 - MASKING</u>			
Duct Tape - 1/2"	25 rolls	25 rolls	NSN 8315-00-890-9872
Duct Tape - 2"	25 rolls	25 rolls	NSN 8315-00-890-5100
Aluminum Tape, High Temp.	15 rolls	15 rolls	NSN 7510-00-816-8077
Utility Blades	10 boxes	10 boxes	NSN 8530-00-162-5629
Plugs (various sizes)			Open Purchase: Lear Siegler, Inc. Accurate Products Div. 4370 Jutland Drive San Diego, CA 92117

Table B-1 SIMA (PS) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
<u>STAGE 4 - STRIP BLASTING</u>			
Garnet Sand, #36 mesh	30,000 lbs.	30,000 lbs	Open Purchase: Barton Mines Corp. P.O. Drawer 400 North Creek, NY 12853
Face welds (disposable)	125	125	Meyers Metals and Minerals, Inc. 459 Coleman Bldg Seattle, WA
Ear Pads	2 boxes	2 boxes	Open Purchase: Bullard Safety Equipment P.O. Box 385 White Oak Pike Cynthiana, KY 40031
			NSN 6515-00-137-6345
<u>STAGE 5 - ANCHOR-TOOTH BLASTING</u>			
Aluminum Oxide Grit, #16 mesh	12,500 lbs.	12,500 lbs.	Open Purchase: KELCO Sales & Engineering, Co Front St. & Paddison Avenue Norwalk, CA 90650
Press Film (X-coarse)	10 rolls	10 rolls	SOHIO Electro Minerals, Co P.O. Box 423 Niagara Falls, NY 14302
			Open Purchase: KTA-TATOR, Inc. 115 Technology Drive Pittsburgh, PA 15275

Table B-1 SIMA (PS) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
<u>STAGE 5 ANCHOR-TOOTH LASTING</u> (Continued)			
Gloves, Blasting	5 prs	5 prs	Open Purchase: Safety Equipment Co 659 Industrial Drive Tallahassee, FL 32304
Face Shields (disposable)	125	125	Open Purchase: Bullard Safety Equipment P.O. Box 385 White Oak Pike Cynthiana, KY 40031
<u>STAGE 6 ALUMINUM-WIRE SPRAYING</u>			
1/8" Aluminum Wire (for flame spraying)	5 rolls	5 rolls	Open Purchase: METCO, Inc. 1101 Prospect Avenue Westbury, NY
Oxygen	15 cylinders	15 cylinders	NSN 6830-00-169-0805
Acetylene	10 cylinders	10 cylinders	NSN 8120-00-268-3360
Glove (cotton)	25 prs	25 prs	NSN 8415-00-268-8318
Respirator	25	25	NSN 4240-00-022-2524
<u>STAGE 7 POWDER COATING</u>			
Powder: Haze Grey White Red Black Yellow	900 lbs. 450 lbs. 275 lbs. 450 lbs. 125 lbs.	100 lbs. 50 lbs. 25 lbs. 50 lbs. 10 lbs.	Open Purchase: International Paint Powder Coatings 6003 Antoine Drive Houston, TX 77292-4224 Tiger Drylac USA, Inc. 9587 Arrow Route, Suite K Rancho Cucamonga, CA 91730

Table B-1 SIMA (PS) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
<u>STAGE 7 - POWDER COATING</u> (Continued)			
Gloves (cotton)	10 prs	5 prs	NSN 8415-00-268-8318
Respirator (disposable, dust filter)	2 boxes	2 boxes	NSN 4240-00-629-8199
Hood (cotton)	10	10	NSN 8415-00-275-3159
Gloves 00°F Heat Resistant	2 prs	1 pr	NSN 8415-00-092-3910
1/8" Aluminum Wire (for suspension)	100 ft	50 ft	NSN 4010-00-222-4482
<u>STAGE 8 - PAINTING</u>			
Respirator, Charcoal Filters	25	20	NSN 4240-00-022-2524
Cheesecloth (strainer)	1 roll	1/2 roll	NSN 8305-00-170-5063
TT-E-78 - EGM Solvent	20 gals	20 gals	NSN 6810-00-222-2751
Formula 150 - Green Primer (type II)	60 gals	60 gals	NSN 8010-00-437-6757
Formula 151 - Haze Grey (type II)	50 gals	50 gals	NSN 8010-00-410-8460
Formula 20 - Ext. Grey Deck	10 gals	10 gals	NSN 8010-00-286-9083
TT-E-4 - White Enamel	4 gals	4 gals	NSN 8010-00-145-0165
TT-E-4 - Haze Grey Enamel	20 gals	20 gals	NSN 8010-00-917-2256
DoD-P-555(SH) Heat Resistant Aluminum Paint	20 gals	20 gals	NSN 8010-01-033-3778
Gloves (plastic)	50 prs	50 prs	NSN 6515-01-149-8842

Table B-1 SIMA (PS) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
<u>STAGE 9 - INSTALLATION KIT DISTRIBUTING</u>			
Anti-Seize Compound	20 tubes	20 tubes	NSN 8030-00-292-1102
Polysulfide Sealant, Type I	12 cans	12 cans	NSN 8050-00-762-8807
Polysulfide Sealant, Type IV	12 cans	12 cans	NSN 8030-00-871-8489
Plastic Bags 6"	100	100	NSN 8105-00-837-7756
Plastic Bags 4"	50	50	NSN 8105-00-837-7753
Plastic Bags 12"	50	25	NSN 8105-00-837-7757
Toggle Pin, 1/2" x 2 1/2", 304 SS	40	As required	NSN 5315-00-664-0462
Toggle Pin, 1/2" x 4", 304 SS	65	As required	NSN 5315-00-664-0463
Toggle Pin, 5/8" x 2 1/2", 304 SS	25	As required	NSN 5315-00-664-0464
Toggle Pin, 5/8" x 5 1/2", 304 SS	350	As required	NSN 5315-00-664-0465
Hinge Pin (raise hatch)	60	As required	NSN 5315-00-753-3875
Washer (raised hatch)	60	As required	NSN
Cotter Pin	540	As required	NSN 5315-00-187-9460
Hinge Pin (scuttle)	95	As required	NSN 5315-00-802-1837
Collar Pin (scuttle)	180	As required	NSN 5315-01-082-2171
Upper Link Pin (scuttle)	45	As required	NSN 5315-01-140-9950
Lower Link Pin (scuttle)	45	As required	NSN 5315-01-142-3595
Collar Link Pin	45	As required	NSN 2040-01-093-1079

Table B-1 SIMA (PS) CORROSION CONTROL SHOP CONSUMABLES LIST

ITEM	INITIAL STOCK	CONSUMPTION PER MONTH	NATIONAL STOCK NUMBER OR OPEN PURCHASE SOURCE
STAGE 9 - INSTALLATION KIT DISTRIBUTING (Continued)			
Hinge Pin (Flush Deck Hatch)	14	As required	NSN 9510-00-189-7383
Washer (Flush Deck Hatch)	11	As required	NSN
Hinge Pin (Door)	475	As required	NSN 5315-00-841-1390
Collar (Door)	475	As required	NSN 3040-00-152-8830

SHIPPING CONTAINER TALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT										
SURE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND										
1. SHEET NO. OF SHEETS: 01 2. DATE MATERIAL REQUIRED: 12 3. AUTHORITY OR PURPOSE: (CORROSION CONTROL, SHIP SIMULATORS) 4. SIGNATURE: _____ 5. DATE SHIPPED: _____ 6. MODE OF SHIPMENT: _____ 7. SUB MOVEMENT INDICATOR OR PORT REFERENCE NO: _____										
PROPERTY ACCTG	TRANS TYPE	AUTHORIZATION ACCTG ACTIVITY	SUBLOT	SUB CONT NO	OBJ CL	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)				AMOUNT
QUANTITY REQUESTED (d)	UNIT OF ISSUE (c)	SUPPLY ACTION (e)	TYPE COM TANKER (f)	COM TANKER (g)	UNIT PRICE (h)	TOTAL COST (i)				
BRUSH TYPE 1 HEXAGONAL HEAD BOLTS IN ACCORDANCE WITH L-5-1222H; (STUDS, BOLTS, HEX CAP SCREWS, SOCKET HEAD P SCREWS AND NUTS"; DATED 21 OCTOBER 1986). THE BOLTS SHALL BE MADE OF CORROSION RESISTANT AUSTENITIC STEEL, MATERIAL GRADE (ALLOY) 316, IN ACCORDANCE WITH MIL F 593-85. THE FASTENERS SHALL BE COLD WORKED; SHEER FACED AND INDIVIDUALLY MARKED WITH THE MATERIAL CODE, IN ACCORDANCE WITH MIL-S-1222H. THE DIMENSIONS OF THE BOLTS SHALL BE IN ACCORDANCE WITH CABLE 2 OF (SI B18.2.1 - 1981, SQUARE AND HEX BOLTS AND SCREWS WITH SERIES. THE THREADS SHALL BE UNIFIED NATIONAL LARGE THREAD SERIES, CLASS 2A. THE BOLTS SHALL BE PROVIDED IN THE FOLLOWING SIZES AND QUANTITIES (DIMENSIONS ARE IN INCHES UNLESS OTHERWISE STATED):										
16. TOTAL QUANTITY AVAILABLE TO: _____ 17. SPECIAL HANDLING: _____ 18. TOTAL WEIGHT: _____ 19. TOTAL VOLUME: _____ 20. TOTAL COST: _____ 21. TOTAL QUANTITY: _____ 22. TOTAL VOLUME: _____ 23. TOTAL COST: _____ 24. TOTAL QUANTITY: _____ 25. TOTAL VOLUME: _____ 26. TOTAL COST: _____ 27. TOTAL QUANTITY: _____ 28. TOTAL VOLUME: _____ 29. TOTAL COST: _____ 30. TOTAL QUANTITY: _____ 31. TOTAL VOLUME: _____ 32. TOTAL COST: _____ 33. TOTAL QUANTITY: _____ 34. TOTAL VOLUME: _____ 35. TOTAL COST: _____ 36. TOTAL QUANTITY: _____ 37. TOTAL VOLUME: _____ 38. TOTAL COST: _____ 39. TOTAL QUANTITY: _____ 40. TOTAL VOLUME: _____ 41. TOTAL COST: _____ 42. TOTAL QUANTITY: _____ 43. TOTAL VOLUME: _____ 44. TOTAL COST: _____ 45. TOTAL QUANTITY: _____ 46. TOTAL VOLUME: _____ 47. TOTAL COST: _____ 48. TOTAL QUANTITY: _____ 49. TOTAL VOLUME: _____ 50. TOTAL COST: _____										

REQUISITION AND INVOICE/SHIPPING DOCUMENT

STAIRS INTERMEDIATE MAINTENANCE ACTIVITY PUEBT SIND

[illegible]

DD 1149.9 PT1

100-100-100

10. The following table shows the number of people who have been convicted of a crime in the United States since 1990, by race and gender. The data is presented in millions of people.

ORIGINAL

REQUISITION AND INVOICE/SHIPPING DOCUMENT														
SHEET INTERMEDIATE MAINTENANCE ACTIVITY PULST SOUND														
SHEET NO. 04 OF 12														
5 REQUISITION DATE														
6 REQUISITION NUMBER														
7 DATE MATERIAL REQUIRED														
8 AUTHORITY OR PURPOSE														
CORROSION CONTROL SHEET SIMA (PS)														
9 SIGNATURE														
10 NUMBER NUMBER AND DATE														
11 DATE SHIPPED														
12 MODE OF SHIPMENT														
13 BILL OF LADING NUMBER														
14 AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO.														
PROPERTY ACTG. CODE														
AMOUNT														
FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES														
(b)														
FINAL SIZE UNC LENGTH COST CODE														
13	6	18	2											
14	6	18	2 1/2											
15	6	18	3 1/2											
16		16	3/4											
17		16	1											
18		16	1 1/4											
16 TRANSFER STATION VIA MATS														
17 SPECIAL MARKING														
18 TOTAL CONTAINERS														
19 TOTAL INCHES														
20 TOTAL WEIGHT														
21 TOTAL VOLUME														
22 TOTAL VALUE														
23 TOTAL COST														
24 TOTAL LABOR														
25 TOTAL MATERIAL														
26 TOTAL FREIGHT														
27 TOTAL TAXES														
28 TOTAL OTHER														
29 TOTAL														

ORIGINAL

3-11

SHIPPING CONTAINER TALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT										
SINGLE INTERMEDIATE MAINTENANCE ACTIVITY PUJET SOUND										
1. NO. OF SHEETS: 09 2. DATE MATERIAL REQUIRED: 12 3. AUTHORITY OR PURPOSE: CORROSION CONTROL SHEET SIMA (PS) 4. SIGNATURE: _____ 5. DATE SHIPPED: _____ 6. MODE OF SHIPMENT: _____ 7. AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO: _____										
PROPERTY ACTIVITY	TRANS TYPE	AUTHORIZATION ACTIVITY	SUBAL LOT	SUR CONT NO	OBJ CL	GENERAL STOCK NUMBER DESCRIPTION AND COMING OF MATERIAL AND/OR SERVICES (b)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	UNIT PRICE (f)	TOTAL COST (g)
	FA					NUTS UNC LENGTH COST CODE	1300		.090	\$ 117.00
	EA					THREAD	700		.100	70.00
	EA						100		.110	11.00
	EA						150		.134	20.10
	EA						25		.144	3.60
	EA						325		.104	33.80
17. SPECIAL HANDLING: _____										
18. TRANSPORTATION VIA MATS: _____										
19. SUMMARY:										
TOTAL CONTAINERS: _____ TOTAL WEIGHT: _____ TOTAL VOLUME: _____ TOTAL VALUE: _____										

SHORE: INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

9 AUTHORITY OR PURPOSE CORROSION CONTROL, SHIP SIMA(PS)	
10 SIGNATURE	11 VOUCHER NUMBER AND DATE
12 DATE SHIPPED	
13 MODE OF SHIPMENT	14 BILL OF LADING NUMBER
15 AIR MOVEMENT DISCUSSION OR PORT REFERENCE NO	

APPROPRIATION AND SUBHEAD				OBJ CL	SUR CONT NO	SUBAL LOT	AUTHORIZATION ACTG & ACTIVITY	TRANS TYPE	PROPERTY ACTG & ACTIVITY			COST CODE			AMOUNT		
GENERAL STOCK NUMBER DESCRIPTION AND COMING OF MATERIAL AND/OR SERVICES (b)									QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE COM TRANS (f)	COM TRANS (g)	UNIT PRICE (h)	TOTAL COST (i)			
LINE NO	NAME (a)	UNC	LENGTH	COST CODE													
25	7/16	14	1 3/4					EA	25					.151	\$	3.78	
26	7/16	14	2 1/2					EA	25					.203		5.08	
27	7/16	14	4					EA	25					.318		7.95	
28	1/2	13	3/4					EA	25					.125		3.13	
29	1/2	13	1					EA	25					.140		3.50	
30	1/2	13	1 1/4					EA	75					.145		10.88	

[illegible]

SHIPPING CONTAINERALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

CORROSION CONTROL SHIP SIMA (PS)

1. NAME OF SHIP TO WHICH FOR

2. DATE SHIPPED

3. MODE OF SHIPMENT

4. BILL OF LADING NUMBER

5. AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO.

6. APPROVAL AND SIGNATURE

7. PROPERTY ACTIVITY

8. COUNTRY

9. COST CODE

10. AMOUNT

11. TRANSIT TYPE

12. AUTHORIZATION ACTIVITY

13. SUBAL LOT

14. SUB CONT NO

15. OBJ CL

16. FEDERAL STOCK NUMBER DESCRIPTION AND COMING OF MATERIAL AND/OR SERVICES (b)

17. UNIT OF MEASURE

18. QUANTITY REQUESTED (d)

19. SUPPLY ACTION (e)

20. TYPE COM NUMBER (f)

21. UNIT PRICE (h)

22. TOTAL COST (i)

NAT'L UNC LENGTH COST CODE

SIZE THREAD

43 5 11 3 1/2 EA 325 .606 \$ 196.95

44 5 11 4 EA 25 .678 16.45

45 3/4 10 1 EA 25 .7 17.50

46 3/4 10 1 1/4 EA 25 .7 17.50

47 3/4 10 1 1/2 EA 25 .7 17.50

48 3/4 10 1 3/4 EA 25 .75 18.75

19. TRANSPORTATION VIA MATS OR MATS AVAILABLE TO

20. TOTAL CONTAINER

21. TYPE COM NUMBER

22. DESCRIPTION

23. TOTAL WEIGHT

24. SPECIAL HANDLING

25. DATE

26. CONTAINER RECEIVED EXCEPT AS NOTED

27. QUANTITIES RECEIVED EXCEPT AS NOTED

28. POSTED

29. DATE

30. DATE

31. DATE

32. DATE

33. DATE

34. DATE

35. DATE

36. DATE

37. DATE

38. DATE

39. DATE

40. DATE

41. DATE

42. DATE

43. DATE

44. DATE

45. DATE

46. DATE

47. DATE

48. DATE

49. DATE

50. DATE

51. DATE

52. DATE

53. DATE

54. DATE

55. DATE

56. DATE

57. DATE

58. DATE

59. DATE

60. DATE

61. DATE

62. DATE

63. DATE

64. DATE

65. DATE

66. DATE

67. DATE

68. DATE

69. DATE

70. DATE

71. DATE

72. DATE

73. DATE

74. DATE

75. DATE

76. DATE

77. DATE

78. DATE

79. DATE

80. DATE

81. DATE

82. DATE

83. DATE

84. DATE

85. DATE

86. DATE

87. DATE

88. DATE

89. DATE

90. DATE

91. DATE

92. DATE

93. DATE

94. DATE

95. DATE

96. DATE

97. DATE

98. DATE

99. DATE

100. DATE

DD FORM 1149 (9 PT)

ORIGINAL

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-373-972

SHIPPING CONTAINER TALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PUFET SOUND

CORROSION CONTROL, SHIP SIMA(PS)

1 NAME

2 NO

3 UNIT TO BE FOR

4 APPROVAL AND SUBMIT

5 PROJ CL

6 SUB CONT NO

7 SUBAL LOT

8 AUTHORIZATION ACTG'S ACTIVITY

9 TRANS TYPE

10 PROPERTY ACTG'S ACTIVITY

11 COUN TRY

12 COST CODE

13 AMOUNT

14 FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

15 UNIT OF ISSUE

16 QUANTITY REQUESTED

17 SUPPLY ACTION

18 TYPE COM TENDER

19 UNIT PRICE

20 TOTAL COST

21 NAT'L SIZE

22 UNC THREAD

23 LENGTH

24 COST CODE

25 49

26 50

27 51

28 52

29 53

30 54

31 10

32 2

33 10

34 2 1/2

35 10

36 3

37 10

38 3 1/2

39 10

40 4 1/2

41 10

42 6

43 EA

44 25

45 EA

46 25

47 EA

48 100

49 EA

50 550

51 EA

52 25

53 EA

54 25

55 \$

56 18.75

57 .75

58 .77

59 .79

60 .79

61 .81

62 .85

63 19.25

64 79.00

65 434.50

66 20.25

67 21.25

16 TRANSP. STATION VIA MATS

17 SPECIAL HANDLING

18 TOTAL

19 TOTAL

20 TOTAL

21 TOTAL

22 TOTAL

23 TOTAL

24 TOTAL

25 TOTAL

26 TOTAL

27 TOTAL

28 TOTAL

29 TOTAL

30 TOTAL

31 TOTAL

32 TOTAL

33 TOTAL

34 TOTAL

35 TOTAL

36 TOTAL

37 TOTAL

38 TOTAL

39 TOTAL

40 TOTAL

41 TOTAL

42 TOTAL

43 TOTAL

44 TOTAL

45 TOTAL

46 TOTAL

47 TOTAL

48 TOTAL

49 TOTAL

50 TOTAL

51 TOTAL

52 TOTAL

53 TOTAL

54 TOTAL

55 TOTAL

56 TOTAL

57 TOTAL

58 TOTAL

59 TOTAL

60 TOTAL

61 TOTAL

62 TOTAL

63 TOTAL

64 TOTAL

65 TOTAL

66 TOTAL

67 TOTAL

68 TOTAL

69 TOTAL

70 TOTAL

71 TOTAL

72 TOTAL

73 TOTAL

74 TOTAL

75 TOTAL

76 TOTAL

77 TOTAL

78 TOTAL

79 TOTAL

80 TOTAL

81 TOTAL

82 TOTAL

83 TOTAL

84 TOTAL

85 TOTAL

86 TOTAL

87 TOTAL

88 TOTAL

89 TOTAL

90 TOTAL

91 TOTAL

92 TOTAL

93 TOTAL

94 TOTAL

95 TOTAL

96 TOTAL

97 TOTAL

98 TOTAL

99 TOTAL

100 TOTAL

DD FORM 1149 (9 PT)

NOV 1961

ORIGINAL

B-17

SHIPPING CONTAINER NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

1. AUTHORITY OR PURPOSE
(CORROSION CONTROL SHIP SIMA(PS))

10. SIGNATURE

11. DATE SHIPPED

12. MODE OF SHIPMENT

13. BILL OF LADING NUMBER

14. AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO.

AMOUNT

COST CODE

PROPERTY ACCTG

TRANS TYPE

AUTHORIZATION ACCTG ACTIVITY

SUBAL LOT

BLUR CONT NO

OBJ CL

UNC

LENGTH

COST CODE

UNIT OF ISSUE (CT)

QUANTITY REQUESTED (d)

SUPPLY ACTION (e)

TYPE OF ISSUE (f)

UNIT PRICE (h)

TOTAL COST (i)

15. FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)

N.T. NAL
S I E
9 3 1/2
9 4 1/2
8 9 1/2

55 7 9

EA 200

.9

\$ 180.00

56 7 9

EA 325

.9

337.50

57 1

EA 10

.95

9.75

16. TRANSPORTATION VIA MATS OR BILLS OF LADING TO

17. SPECIAL HANDLING

TOTAL CONTAINERS

TYPE OF PACKAGE

DESCRIPTION

TOTAL WEIGHT

TOTAL CUBIC FEET

CONTAINERS RECEIVED

EXCEPTAL NOTED

DATE

BY

SHEET TOTAL

CONTAINERS RECEIVED

EXCEPTAL NOTED

DATE

BY

CARD TOTAL

20. RECEIVERS VOUCHER NO.

← TOTAL →

DD FORM 1149 (9 PT)

ORIGINAL

FORM 1149 (9 PT)

SHIPPING CONTAINERIALITY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUEBT SOUND

CORROSION CONTROL SHOP SIMALAPS

1. NAME

2. DATE

3. TIME TO MARK FOR

4. APPROPRIATE AND SUGGEST

5. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

6. APPROPRIATE AND SUGGEST

7. NAME

8. DATE

9. TIME TO MARK FOR

10. APPROPRIATE AND SUGGEST

11. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

12. APPROPRIATE AND SUGGEST

13. NAME

14. DATE

15. TIME TO MARK FOR

16. APPROPRIATE AND SUGGEST

17. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

18. APPROPRIATE AND SUGGEST

19. NAME

20. DATE

21. TIME TO MARK FOR

22. APPROPRIATE AND SUGGEST

23. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

24. APPROPRIATE AND SUGGEST

25. NAME

26. DATE

27. TIME TO MARK FOR

28. APPROPRIATE AND SUGGEST

29. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

30. APPROPRIATE AND SUGGEST

31. NAME

32. DATE

33. TIME TO MARK FOR

34. APPROPRIATE AND SUGGEST

35. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

36. APPROPRIATE AND SUGGEST

37. NAME

38. DATE

39. TIME TO MARK FOR

40. APPROPRIATE AND SUGGEST

41. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

42. APPROPRIATE AND SUGGEST

43. NAME

44. DATE

45. TIME TO MARK FOR

46. APPROPRIATE AND SUGGEST

47. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

48. APPROPRIATE AND SUGGEST

49. NAME

50. DATE

51. TIME TO MARK FOR

52. APPROPRIATE AND SUGGEST

53. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

54. APPROPRIATE AND SUGGEST

55. NAME

56. DATE

57. TIME TO MARK FOR

58. APPROPRIATE AND SUGGEST

59. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

60. APPROPRIATE AND SUGGEST

61. NAME

62. DATE

63. TIME TO MARK FOR

64. APPROPRIATE AND SUGGEST

65. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

66. APPROPRIATE AND SUGGEST

67. NAME

68. DATE

69. TIME TO MARK FOR

70. APPROPRIATE AND SUGGEST

71. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

72. APPROPRIATE AND SUGGEST

73. NAME

74. DATE

75. TIME TO MARK FOR

76. APPROPRIATE AND SUGGEST

77. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

78. APPROPRIATE AND SUGGEST

79. NAME

80. DATE

81. TIME TO MARK FOR

82. APPROPRIATE AND SUGGEST

83. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

84. APPROPRIATE AND SUGGEST

85. NAME

86. DATE

87. TIME TO MARK FOR

88. APPROPRIATE AND SUGGEST

89. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

90. APPROPRIATE AND SUGGEST

91. NAME

92. DATE

93. TIME TO MARK FOR

94. APPROPRIATE AND SUGGEST

95. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

96. APPROPRIATE AND SUGGEST

97. NAME

98. DATE

99. TIME TO MARK FOR

100. APPROPRIATE AND SUGGEST

101. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

102. APPROPRIATE AND SUGGEST

103. NAME

104. DATE

105. TIME TO MARK FOR

106. APPROPRIATE AND SUGGEST

107. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

108. APPROPRIATE AND SUGGEST

109. NAME

110. DATE

111. TIME TO MARK FOR

112. APPROPRIATE AND SUGGEST

113. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

114. APPROPRIATE AND SUGGEST

115. NAME

116. DATE

117. TIME TO MARK FOR

118. APPROPRIATE AND SUGGEST

119. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

120. APPROPRIATE AND SUGGEST

121. NAME

122. DATE

123. TIME TO MARK FOR

124. APPROPRIATE AND SUGGEST

125. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

126. APPROPRIATE AND SUGGEST

127. NAME

128. DATE

129. TIME TO MARK FOR

130. APPROPRIATE AND SUGGEST

131. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

132. APPROPRIATE AND SUGGEST

133. NAME

134. DATE

135. TIME TO MARK FOR

136. APPROPRIATE AND SUGGEST

137. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

138. APPROPRIATE AND SUGGEST

139. NAME

140. DATE

141. TIME TO MARK FOR

142. APPROPRIATE AND SUGGEST

143. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

144. APPROPRIATE AND SUGGEST

145. NAME

146. DATE

147. TIME TO MARK FOR

148. APPROPRIATE AND SUGGEST

149. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

150. APPROPRIATE AND SUGGEST

151. NAME

152. DATE

153. TIME TO MARK FOR

154. APPROPRIATE AND SUGGEST

155. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

156. APPROPRIATE AND SUGGEST

157. NAME

158. DATE

159. TIME TO MARK FOR

160. APPROPRIATE AND SUGGEST

161. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

162. APPROPRIATE AND SUGGEST

163. NAME

164. DATE

165. TIME TO MARK FOR

166. APPROPRIATE AND SUGGEST

167. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

168. APPROPRIATE AND SUGGEST

169. NAME

170. DATE

171. TIME TO MARK FOR

172. APPROPRIATE AND SUGGEST

173. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

174. APPROPRIATE AND SUGGEST

175. NAME

176. DATE

177. TIME TO MARK FOR

178. APPROPRIATE AND SUGGEST

179. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

180. APPROPRIATE AND SUGGEST

181. NAME

182. DATE

183. TIME TO MARK FOR

184. APPROPRIATE AND SUGGEST

185. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

186. APPROPRIATE AND SUGGEST

187. NAME

188. DATE

189. TIME TO MARK FOR

190. APPROPRIATE AND SUGGEST

191. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

192. APPROPRIATE AND SUGGEST

193. NAME

194. DATE

195. TIME TO MARK FOR

196. APPROPRIATE AND SUGGEST

197. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

198. APPROPRIATE AND SUGGEST

199. NAME

200. DATE

201. TIME TO MARK FOR

202. APPROPRIATE AND SUGGEST

203. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

204. APPROPRIATE AND SUGGEST

205. NAME

206. DATE

207. TIME TO MARK FOR

208. APPROPRIATE AND SUGGEST

209. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

210. APPROPRIATE AND SUGGEST

211. NAME

212. DATE

213. TIME TO MARK FOR

214. APPROPRIATE AND SUGGEST

215. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

216. APPROPRIATE AND SUGGEST

217. NAME

218. DATE

219. TIME TO MARK FOR

220. APPROPRIATE AND SUGGEST

221. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

222. APPROPRIATE AND SUGGEST

223. NAME

224. DATE

225. TIME TO MARK FOR

226. APPROPRIATE AND SUGGEST

227. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

228. APPROPRIATE AND SUGGEST

229. NAME

230. DATE

231. TIME TO MARK FOR

232. APPROPRIATE AND SUGGEST

233. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

234. APPROPRIATE AND SUGGEST

235. NAME

236. DATE

237. TIME TO MARK FOR

238. APPROPRIATE AND SUGGEST

239. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

240. APPROPRIATE AND SUGGEST

241. NAME

242. DATE

243. TIME TO MARK FOR

244. APPROPRIATE AND SUGGEST

245. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

246. APPROPRIATE AND SUGGEST

247. NAME

248. DATE

249. TIME TO MARK FOR

250. APPROPRIATE AND SUGGEST

251. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

252. APPROPRIATE AND SUGGEST

253. NAME

254. DATE

255. TIME TO MARK FOR

256. APPROPRIATE AND SUGGEST

257. GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

258. APPROPRIATE AND SUGGEST

259. NAME

260. DATE

SHIPPING CONTAINERIALITY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

STREET INTERMEDIATE MAINTENANCE ACTIVITY PACKET SOUND

9 AUTHORITY OR PURPOSE
(EXPRESSION (UNITED) SHIP SIMA(PS))

10 SIGNATURE

11 DATE SHIPPED

12 MODE OF SHIPMENT

13 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

SECTION AND SUBHEAD		OBJ CL	BUR CONT NO	SUBAL LOT	AUTHORIZATION ACCT G ACTIVITY	TRANS TYPE	PROPERTY ACCT G		COUN TRY	COST CODE		AMOUNT		
FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES							UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE TAINER (f)	CON TAINER NOS (g)	UNIT PRICE (h)	TOTAL COST (i)	
(b)														
MINAL		UNC		COST CODE										
SIZE		THREAD												
01		24				EA	1300					.30	\$ 390.00	
02	1	20				EA	5000					.43	2150.00	
03	1. 16	18				EA	500					.45	225.00	
04	3	16				EA	8600					.67	5762.00	
05	16	14				EA	200					.19	38.00	
06	1. 2	13				EA	2600					.15	390.00	

PORTATION VIA MATS IN CHARGEABLE TO												17 SPECIAL HANDLING							
TOTAL CONTAINER		TOTAL COM TAINER		DESCRIPTION		TOTAL WEIGHT		TOTAL CUBE		18		CONTAINERS RECEIVED EXCEPT AS NOTED		DATE		BY		SHEET TOTAL	
10 00										RECEIVED		QUANTITIES RECEIVED EXCEPT AS NOTED		DATE		BY		GRAND TOTAL	
10 00												POSTED		DATE		BY		20 RECEIVERS VOUCHER NO	
10 00																			

← TOTAL →

SHIPPING CONTAINERALLY — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SICRE INTERMEDIATE MAINTENANCE ACTIVITY (HET SXIN)

1 SHEET NO. OF SHEETS 103	2 REQUISITION DATE 14	3 DATE MATERIAL REQUIRED	4 REQUISITION NUMBER
5 AUTHORITY UNION (UNITED STATES)			6 PRIORITY
10 SIGNATURE			11 VOUCHER NUMBER AND DATE
12 DATE SHIPPED			13 BILL OF LADING NUMBER
14 MODE OF SHIPMENT			
15 AIR MOVEMENT DESIGNATOR OR PART REFERENCE NO.			

ITEM NO.	APPROPRIATE AND SUBHEAD	OBJ CL	BUN CONT NO	SUBAL LOT	AUTHORIZATION ACTG ACTIVITY	TRANS TYPE	PROPERTY ACCT G ACTIVITY	COUN TRY	COST CODE	AMOUNT		
										QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TOTAL COST (f)
	GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)					UNIT OF ISSUE (c)						
07	UNC (COST CODE)					EA				500		\$ 130.00
08	12					EA				2300		805.00
09	11					EA				1100		495.00
10	9					EA				20		11.20
11	8					EA						

16 TRANSPORTATION VIA MATS OR MOUNTAIN CARGOABLE TO		17 SPECIAL HANDLING	
ISSUED BY	RECEIVED BY	TOTAL CONTAINER	TOTAL WEIGHT
DATE	DATE	TOTAL	TOTAL
12	12	12	12
13	13	13	13
14	14	14	14
15	15	15	15
16	16	16	16
17	17	17	17
18	18	18	18
19	19	19	19
20	20	20	20
21	21	21	21
22	22	22	22
23	23	23	23
24	24	24	24
25	25	25	25
26	26	26	26
27	27	27	27
28	28	28	28
29	29	29	29
30	30	30	30
31	31	31	31
32	32	32	32
33	33	33	33
34	34	34	34
35	35	35	35
36	36	36	36
37	37	37	37
38	38	38	38
39	39	39	39
40	40	40	40
41	41	41	41
42	42	42	42
43	43	43	43
44	44	44	44
45	45	45	45
46	46	46	46
47	47	47	47
48	48	48	48
49	49	49	49
50	50	50	50

NO. 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

SHIPPING CONTAINER TALLY — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PURCHASER

9 AUTHORITY (ORIGIN) (UNION) SHIP SINA (PS)

10 SIGNATURE (11) VOUCHER NUMBER AND DATE

12 DATE SHIPPED

13 MODE OF SHIPMENT

14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

PROPERTY ACCT G COUN TRY COST CODE AMOUNT

QUANTITY REQUESTED (d) SUPPLY ACTION (e) TYPE CON TAINER NOS (f) UNIT PRICE (h) TOTAL COST (i)

REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.

THREE SOURCES OF SUPPLY ARE PROVIDED:

FALCON METAL CORP.
10715 John Price Road
Dept. T
P.O. Box 7429
Charlotte, NC 28217
1-800-438-0332

SAVISON INDUSTRIES, INC.
3440-A Overland Ave.
Los Angeles, CA 90034
213-559-3845

16 TRANSPORTATION VIA MARS

17 SPECIAL HANDLING

18 TOTAL CONTAINER

19 TOTAL WEIGHT

20 TOTAL CUBE

21 TOTAL

22 TOTAL

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50 TOTAL

51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ADDITIONAL

SHIPPING CONTAINERIALITY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SIRE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

CORROSION CONTROL SHIP SIMA(PS)

NAME FOR

DATE SHIPPED

MODE OF SHIPMENT

BILL OF LADING NUMBER

AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO

IN AND SUBHEAD

OBJ CL

BUR CONT NO

SUBAL LOT

AUTOMIZATION ACTG ACTIVITY

TRANS TYPE

PROPERTY ACCTG ACTIVITY

COUN TRY

COST CODE

AMOUNT

FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)

QUANTITY REQUESTED (d)

UNIT OF ISSUE (c)

SUPPLY ACTION (e)

TYPE COM TAINER (f)

CON TAINER NOS (g)

UNIT PRICE (h)

TOTAL COST (i)

FINISH HEXAGONAL LOCK NUTS. THE NUTS SHALL BE MADE OF CORROSION RESISTANT AUSTENITIC STEEL, MATERIAL GRADE (LOY) 316, IN ACCORDANCE WITH ASTM F 593-85. THE NUTS SHALL BE COLD WORKED AND INDIVIDUALLY MARKED WITH THE MATERIAL GRADE, IN ACCORDANCE WITH MIL-S-22862. THE LOCK NUTS SHALL BE OF THE PLASTIC INSERT TYPE. THE THREADS SHALL BE UNIFIED NATIONAL COURSE LEAD SERIES, BLASTS 2A. THE NUTS SHALL BE PROVIDED THE FOLLOWING SIZES AND QUANTITIES (DIMENSIONS ARE INCHES UNLESS OTHERWISE STATE).

RELATION VIA MATS

CHARACTERABLE TO

TYPE COM TAINER

DESCRIPTION

TOTAL WEIGHT

TOTAL COST

CONTAINERS RECEIVED

DATE

SHEET TOTAL

DD FORM 1149 (9 PT)

ORIGINAL

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

NO. 0102 OF 011 1801

REQUISITION AND INVOICE/SHIPPING DOCUMENT									
SIRE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND									
SHEET NO. OF SHEETS 02 / 03		5 REQUISITION DATE		8 REQUISITION NUMBER		9 AUTHORITY OR PURPOSE		10 SIGNATURE	
7 DATE MATERIAL REQUIRED		11- VOUCHER NUMBER AND DATE		12 DATE SHIPPED		13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER	
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.		PROPERTY ACT G		COST CODE		AMOUNT			
QUANTITY REQUESTED (d)		SUPPLY ACTION (e)		TYPE CON TAINER NOS (f)		UNIT PRICE (h)		TOTAL COST (i)	
UNIT ISSUE (c)		AUTORIZATION ACT G ACTIVITY		SUBAL LOT		BUR CONT NO		OBJ CL	
FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)		COST CODE							
ORIGINAL SIZE UNC THREAD									
01	/4 20	EA	50				.45	\$	22.00
02	/16 18	EA	10				.45		4.50
03	/8 16	EA	250				.70		175.00
04	/2 13	EA	175				.25		43.50
05	/8 11	EA	25				.40		10.00
17 SPECIAL HANDLING									
CONTAINER		TOTAL WEIGHT		TOTAL CUBE		DATE		BY	
SHEET TOTAL		GRAND TOTAL		RECEIVER'S VOUCHER NO.					

NEW YORK 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
 JAN 59 1149 (9 PT)

REPLACES EDITION OF 1 MAY 50 WHICH MAY BE USED

ORIGINAL

SHIPPING CONTAINER FULLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT									
SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND									
1. SHEET NO. OF SHEETS 03		2. REQUISITION DATE 03		3. REQUISITION NUMBER 03		4. PRIORITY		5. REQUISITION NUMBER	
6. AUTHORITY OR PURPOSE CORROSION CONTROL SHIP SIMA (PS)		7. DATE MATERIAL REQUIRED		8. VOUCHER NUMBER AND DATE		9. SIGNATURE		10. BILL OF LADING NUMBER	
11. DATE SHIPPED		12. MODE OF SHIPMENT		13. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.		14. PROPERTY ACTIVITY		15. COST CODE	
16. FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)		17. SUBAL LOT		18. BUR CONT NO		19. AUTHORIZATION ACTIVITY		20. TRANS TYPE	
21. QUANTITY REQUESTED (d)		22. SUPPLY ACTION (e)		23. TYPE CON TAINER NOS (f)		24. UNIT PRICE (h)		25. TOTAL COST (i)	
<p>REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.</p> <p>THREE SOURCES OF SUPPLY ARE PROVIDED:</p> <p>FALCON METAL CORP. STOCK EXCHANGER 10715 John Price Road P.O. Box 249 Dept. T Canton, TX 75103 P.O. Box 7429 PH: 214-848-8561 Charlotte, NC 28217 1-800-438-0332</p> <p>SAVISON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845</p>									
17. SPECIAL HANDLING									
18. TRANSPORTATION VIA MATS									
19. SPECIAL HANDLING									
20. SPECIAL HANDLING									
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49. SPECIAL HANDLING									
50. SPECIAL HANDLING									

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUEBT SOUND

9 AUTHORITY OR PURPOSE
CORROSION CONTROL SHIP SIMA(PS)

10 SIGNATURE

11 DATE MATERIAL REQUIRED

12 DATE SHIPPED

13 MODE OF SHIPMENT

14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO

PROPERTY ACTIVITY

COUN TRY

COST CODE

AMOUNT

TRANS TYPE

AUTHORIZATION ACTG ACTIVITY

SUBAL LOT

BUR CONT NO

OBJ CL

STATION AND SUBHEAD

FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

(b)
BRNISH PLAIN WASHERS. THE WASHERS SHALL BE MADE OF
CORROSION RESISTANT AUSTENITIC STEEL, MATERIAL GRADE
A307 (LLOYD) 316, IN ACCORDANCE WITH THE CHEMICAL
REQUIREMENTS DESCRIBED IN TABLE 1 OR ASTM F 593-85.
THE WASHERS SHALL BE FREE FROM BURRS, LOOSE SCALE,
SHARP EDGES AND ALL OTHER DEFECTS THAT MIGHT AFFECT
THEIR SERVICEABILITY. THEY SHALL HAVE A SURFACE FINISH
PRODUCED IN ACCORDANCE WITH ASTM A 380-78. THE
WASHERS SHALL BE FURNISHED WITHOUT AN ADDITIVE CHEMICAL
TREATMENT. METALLIC FINISH AND SHALL BE INDIVIDUALLY MARKED
WITH THE MATERIAL GRADE. STAMPING SHALL BE PERMANENT
AND MAY BE RAISED OR DEPRESSED. STAMPING SHALL BE MADE
WITH A LOW STRESS STAMP. WASHER DIMENSIONS SHALL BE IN
ACCORDANCE WITH TABLE 1A OF ANSI B18-22.1 - 1965, PLAIN
WASHERS.

16 PORTION VIA MATS
THIS IS CHARGEABLE TO

17 SPECIAL HANDLING

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER	TOTAL CONTAINER
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RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	RECEIVED BY	
DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
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BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY
POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	POSTED	
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GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL
RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	RECEIVERS VOUCHER NO	

← TOTAL →

SHIPPING CONTAINERALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT									
SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND									
<div> <div>NO. OF SHEETS</div> <div>02</div> <div>04</div> </div> <div>5 REQUISITION DATE</div> <div>6 REQUISITION NUMBER</div> <div>7 DATE MATERIAL REQUIRED</div> <div>8 PRIORITY</div>									
<div> <div>9 AUTHORITY OR PURPOSE</div> <div>CORROSION CONTROL, SHOP SIMA (PS)</div> <div>10 SIGNATURE</div> <div>11 VOUCHER NUMBER AND DATE</div> <div>12 DATE SHIPPED</div> <div>13 MODE OF SHIPMENT</div> <div>14 BILL OF LADING NUMBER</div> <div>15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO</div> </div>									
PROPERTY ACCTG ACTIVITY		COUN TRY		COST CODE		AMOUNT			
FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES		SUBAL LOT		AUTHORIZATION ACCTG ACTIVITY		TRANS TYPE			
(b)									
MINIMAL WASHER SIZE		COST CODE		UNIT OF ISSUE		QUANTITY REQUESTED		TOTAL COST	
01	10						1000	.20	\$ 200.00
02	14						5000	.25	1250.00
03	16						1000	.05	50.00
04	18						10,000	.07	700.00
05	16						500	.30	500
06	12						2,650	.14	371.00

DD FORM 1149 (9 PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

S/N 0102 LP 011 1801

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

SHIPPING CONTAINERALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

STORE INTERMEDIATE MAINTENANCE ACTIVITY RUET SOUND

9 AUTHORITY CONTROL, SHIP SIMA (PS)

10 SIGNATURE

11 NAME FOR

12 DATE SHIPPED

13 MODE OF SHIPMENT

14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

NATION AND SUBHEAD		OBJ CL	SUM CONT NO	SUBAL LOT	AUTHORIZATION ACCTG ACTIVITY	TRANS TYPE	PROPERTY ACCTG ACTIVITY		COUN TRY	COST CODE			AMOUNT			
FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)											QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER (f)	CON TAINER MOVS (g)	UNIT PRICE (h)	TOTAL COST (i)
MINIMAL WASHER SIZE																
07	/16					FA	500						.20	\$ 100.00		
08	/8					FA	2150						.20	430.00		
09	/4					FA	2150						.20	430.00		
10	/8					FA	500						.20	100.00		
11						FA	80						.30	6.00		

SHIPPING CONTAINER TALLY — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

9 AUTHORITY CONTROL SHOP SIMA(PS)

10 SIGNATURE

11 DATE SHIPPED

12 MODE OF SHIPMENT

13 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

PROPERTY ACTIVITY

COST CODE

AMOUNT

REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.

THREE SOURCES OF SUPPLY ARE PROVIDED:

FALCON METAL CORP. STOCK EXCHANGER
10715 John Price Road P.O. Box 249
Dept. T Canton, TX 75103
P.O. Box 7429 PH: 214-848-8561
Charlotte, NC 28217
1-800-438-0332

SAWSON INDUSTRIES, INC.
3440-A Overland Ave.
Los Angeles, CA 90034
213-559-3845

16 SPECIAL HANDLING

18 CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	BY	SHEET TOTAL
19 QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	BY	GRAND TOTAL
20 POSITIO	DATE	BY	20 RECEIVER'S VOUCHER NO

DD FORM 1 MAR 56 1 149 (9 PT) REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED S/N 0102 LF 011 1901 ORIGINAL

SHIPPING CONTAINER RAIL

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHIRE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

IDENTITY OR PURPOSE

CORROSION CONTROL SIPP SIMA(PS)

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RESEARCH AND SUPPORT

AMOUNT

B-32

NUMERICAL SCALE	UNC THREAD	LENGTH	COST CODE
1	1/4-20	1.00	100
2	1/2-13	1.00	100
3	3/4-10	1.00	100
4	1-8	1.00	100
5	1 1/4-6	1.00	100
6	1 1/2-5	1.00	100
7	2-4	1.00	100
8	2 1/2-3	1.00	100
9	3-2	1.00	100
10	3 1/2-2	1.00	100
11	4-2	1.00	100
12	4 1/2-2	1.00	100
13	5-2	1.00	100
14	5 1/2-2	1.00	100
15	6-2	1.00	100
16	6 1/2-2	1.00	100
17	7-2	1.00	100
18	7 1/2-2	1.00	100
19	8-2	1.00	100
20	8 1/2-2	1.00	100
21	9-2	1.00	100
22	9 1/2-2	1.00	100
23	10-2	1.00	100
24	10 1/2-2	1.00	100
25	11-2	1.00	100
26	11 1/2-2	1.00	100
27	12-2	1.00	100
28	12 1/2-2	1.00	100
29	13-2	1.00	100
30	13 1/2-2	1.00	100
31	14-2	1.00	100
32	14 1/2-2	1.00	100
33	15-2	1.00	100
34	15 1/2-2	1.00	100
35	16-2	1.00	100
36	16 1/2-2	1.00	100
37	17-2	1.00	100
38	17 1/2-2	1.00	100
39	18-2	1.00	100
40	18 1/2-2	1.00	100
41	19-2	1.00	100
42	19 1/2-2	1.00	100
43	20-2	1.00	100
44	20 1/2-2	1.00	100
45	21-2	1.00	100
46	21 1/2-2	1.00	100
47	22-2	1.00	100
48	22 1/2-2	1.00	100
49	23-2	1.00	100
50	23 1/2-2	1.00	100
51	24-2	1.00	100
52	24 1/2-2	1.00	100
53	25-2	1.00	100
54	25 1/2-2	1.00	100
55	26-2	1.00	100
56	26 1/2-2	1.00	100
57	27-2	1.00	100
58	27 1/2-2	1.00	100
59	28-2	1.00	100
60	28 1/2-2	1.00	100
61	29-2	1.00	100
62	29 1/2-2	1.00	100
63	30-2	1.00	100
64	30 1/2-2	1.00	100
65	31-2	1.00	100
66	31 1/2-2	1.00	100
67	32-2	1.00	100
68	32 1/2-2	1.00	100
69	33-2	1.00	100
70	33 1/2-2	1.00	100
71	34-2	1.00	100
72	34 1/2-2	1.00	100
73	35-2	1.00	100
74	35 1/2-2	1.00	100
75	36-2	1.00	100
76	36 1/2-2	1.00	100
77	37-2	1.00	100
78	37 1/2-2	1.00	100
79	38-2	1.00	100
80	38 1/2-2	1.00	100
81	39-2	1.00	100
82	39 1/2-2	1.00	100
83	40-2	1.00	100
84	40 1/2-2	1.00	100
85	41-2	1.00	100
86	41 1/2-2	1.00	100
87	42-2	1.00	100
88	42 1/2-2	1.00	100
89	4		

01	5	18	1 1/4
01	5	18	1 1/4

02	16	1 1/4	50
02	16	1 1/4	50

03	16	1 1/2	EA	150
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04	16	1	3/4	10
				FA

03	16	2	FA	15
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16 2 1/2 EA 3

1
STATION VIA MAIL
ON MAIL (MAGNIFI TO

7 SPECIAL

UNCLASSIFIED		CLASSIFIED		TOTAL CONTAINERS		TOTAL WEIGHT		TOTAL VALUE		CONTAINERS RECEIVED		DATE		BY		SHEET TOTAL	
NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION	NO.	DESCRIPTION
1	...	2	...	3	...	4	...	5	...	6	...	7	...	8	...	9	...
10	...	11	...	12	...	13	...	14	...	15	...	16	...	17	...	18	...
19	...	20	...	21	...	22	...	23	...	24	...	25	...	26	...	27	...
28	...	29	...	30	...	31	...	32	...	33	...	34	...	35	...	36	...
37	...	38	...	39	...	40	...	41	...	42	...	43	...	44	...	45	...
46	...	47	...	48	...	49	...	50	...	51	...	52	...	53	...	54	...
55	...	56	...	57	...	58	...	59	...	60	...	61	...	62	...	63	...
64	...	65	...	66	...	67	...	68	...	69	...	70	...	71	...	72	...
73	...	74	...	75	...	76	...	77	...	78	...	79	...	80	...	81	...
82	...	83	...	84	...	85	...	86	...	87	...	88	...	89	...	90	...
91	...	92	...	93	...	94	...	95	...	96	...	97	...	98	...	99	...
100	...	101	...	102	...	103	...	104	...	105	...	106	...	107	...	108	...
109	...	110	...	111	...	112	...	113	...	114	...	115	...	116	...	117	...
118	...	119	...	120	...	121	...	122	...	123	...	124	...	125	...	126	...
127	...	128	...	129	...	130	...	131	...	132	...	133	...	134	...	135	...
136	...	137	...	138	...	139	...	140	...	141	...	142	...	143	...	144	...
145	...	146	...	147	...	148	...	149	...	150	...	151	...	152	...	153	...
154	...	155	...	156	...	157	...	158	...	159	...	160	...	161	...	162	...
163	...	164	...	165	...	166	...	167	...	168	...	169	...	170	...	171	...
172	...	173	...	174	...	175	...	176	...	177	...	178	...	179	...	180	...
181	...	182	...	183	...	184	...	185	...	186	...	187	...	188	...	189	...
190	...	191	...	192	...	193	...	194	...	195	...	196	...	197	...	198	...
199	...	200	...	201	...	202	...	203	...	204	...	205	...	206	...	207	...
208	...	209	...	210	...	211	...	212	...	213	...	214	...	215	...	216	...
217	...	218	...	219	...	220	...	221	...	222	...	223	...	224	...	225	...
226	...	227	...	228	...	229	...	230	...	231	...	232	...	233	...	234	...
235	...	236	...	237	...	238	...	239	...	240	...	241	...	242	...	243	...
244	...	245	...	246	...	247	...	248	...	249	...	250	...				

DD FORM 1149 19 51

TOTAL

ORIGINAL

SHIPPING (CONTINUED) 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PUCET SOUND

AUTHORITY OR PURPOSE
CORROSION CONTROL SHOP SIMA(PS)

SIGNATURE

SHIP TO NAME FOR

DATE SUPPLIER

MODE OF SHIPMENT

DATE OF LABELING NUMBER

DATE MOVEMENT DESIGNATOR OR POST REFERENCE NO

APPROPRIATE AND SUBHEAD

AMOUNT

COST CODE

PROPERTY ACCTG ACTIVITY

TRANS TYPE

AUTHORIZATION ACCTG ACTIVITY

SUBAL LOT

SUB COM NO

OBJ CL

LENGTH

COST CODE

UNIT

QUANTITY REQUESTED (d)

SUPPLY ACTION (e)

TYPE CON TAINER (f)

CON TAINER NOS (g)

UNIT PRICE (h)

TOTAL COST (i)

UNITAL ZE

UNC

LENGTH

COST CODE

THREAD

EA

5

EA

10

EA

15

EA

30

EA

5

EA

85

STATION VIA MATS

CHARGEABLE TO

TOTAL CONTAINER

TOTAL WEIGHT

DESCRIPTION

TOTAL CUBE

CONTAINER RECEIVED

DATE

RECEIVED

DATE

POSTED

RECEIVED

DATE

QUANTITIES RECEIVED

DATE

RECEIVED

DATE

POSTED

DATE

RECEIVED

DATE

POSTED

DD FORM 1149 (9 PT)

ORIGINAL

REQUISITION AND INVOICE/SHIPPING DOCUMENT														
SIRE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND														
SHEET NO. OF SHEETS 05 06														
1. DATE MATERIAL REQUIRED														
2. AUTHORITY OR PURPOSE														
CORROSION CONTROL SHOP SIMA (PS)														
3. SIGNATURE														
4. DATE SHIPPED														
5. MODE OF SHIPMENT														
6. AIR MOVEMENT DESIGNATION OR PORT REFERENCE NO.														
7. PROPERTY ACTIVITY														
8. COST CODE														
9. AMOUNT														
10. FEDERAL STOCK NUMBER DESCRIPTION AND COMING OF MATERIAL AND/OR SERVICES (a)														
11. SUBAL LOT														
12. SUB COM NO														
13. OBJ CL														
14. LENGTH														
15. UNC														
16. THREAD														
17. COST CODE														
18. UNIT OF ISSUE (c)														
19. QUANTITY REQUESTED (d)														
20. SUPPLY ACTION (e)														
21. TYPE COM TANKS (f)														
22. CON TANKS (g)														
23. UNIT PRICE (h)														
24. TOTAL COST (i)														
25. SPECIAL HANDLING														
26. TOTAL RECEIPT														
27. TOTAL														
28. TOTAL RECEIPT														
29. TOTAL RECEIPT														
30. TOTAL RECEIPT														
31. TOTAL RECEIPT														
32. TOTAL RECEIPT														
33. TOTAL RECEIPT														
34. TOTAL RECEIPT														
35. TOTAL RECEIPT														
36. TOTAL RECEIPT														
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45. TOTAL RECEIPT														
46. TOTAL RECEIPT														
47. TOTAL RECEIPT														
48. TOTAL RECEIPT														
49. TOTAL RECEIPT														
50. TOTAL RECEIPT														
13	EA	35												
20	EA	115												
21	EA	40												
22	EA	25												
23	EA	60												
24	EA	50												

ORIGINAL

SHIPPING CONTAINER NO. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SIRE INTERMEDIATE MAINTENANCE ACTIVITY RUET SOUND

1. SHEET NO. OF SHEETS 06 OF 06		2. REQUESTION DATE		3. REQUESTION NUMBER	
4. DATE MATERIAL REQUIRED		5. FREIGHT			
6. AUTHORITY OR PURPOSE CORROSION CONTROL SHIP SIMA (PS)					
7. SIGNATURE					
8. DATE SHIPPED					
9. MODE OF SHIPMENT					
10. BILL OF LADING NUMBER					
11. MOVEMENT OR SIGNATURE OF PORT REFERENCE NO.					

PROPERTY ACTIVITY	COST CODE	AMOUNT
QUANTITY REQUIRED (a)	SUPPLY ACTION (c)	UNIT PRICE (A)
UNIT OF ISSUE (b)	TYPE OF TANKER (d)	TOTAL COST (E)
17. SPECIAL HANDLING		
18. CONTAINER RECEIVED		
19. QUANTITIES RECEIVED		
20. POSTED		

REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.

THREE SOURCES OF SUPPLY ARE PROVIDED:

FALCON METAL CORP. STOCK EXCHANGER
10715 John Price Road P.O. Box 249
Dept. T Canton, TX 75103
P.O. Box 7429 PH: 214-848-8561
Charlotte, NC 28217
1-800-438-0332

SAVISON INDUSTRIES, INC.
3440-A Overland Ave.
Los Angeles, CA 90034
213-559-3845

STATION VIA MATS	CHARGEABLE TO	TOTAL CONTAINER	TOTAL WEIGHT	DESCRIPTION	TOTAL WEIGHT	DATE	CONTAINER RECEIVED	QUANTITIES RECEIVED	POSTED	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL
STATION VIA MATS	CHARGEABLE TO	TOTAL CONTAINER	TOTAL WEIGHT	DESCRIPTION	TOTAL WEIGHT	DATE	CONTAINER RECEIVED	QUANTITIES RECEIVED	POSTED	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL
STATION VIA MATS	CHARGEABLE TO	TOTAL CONTAINER	TOTAL WEIGHT	DESCRIPTION	TOTAL WEIGHT	DATE	CONTAINER RECEIVED	QUANTITIES RECEIVED	POSTED	GRAND TOTAL	GRAND TOTAL	GRAND TOTAL

← TOTAL →

SHIPPING CONTAINER TALLY		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
REQUISITION AND INVOICE/SHIPPING DOCUMENT																																																			
1 FROM SIRE INTERMEDIATE MAINTENANCE ACTIVITY PUEBT SUND																																																			
2 TO																																																			
3 SHIP TO MARK FOR																																																			
4 APPROXIMATE AND SUBHEAD																																																			
5 REQUISITION DATE																																																			
6 REQUISITION NUMBER																																																			
7 DATE MATERIAL REQUIRED																																																			
8 PRIORITY																																																			
9 AUTHORITY (UNIT, SHIP, SIMA, PS)																																																			
10 SIGNATURE																																																			
11 VOUCHER NUMBER AND DATE																																																			
12 DATE SHIPPED																																																			
13 MODE OF SHIPMENT																																																			
14 BILL OF LADING NUMBER																																																			
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO																																																			
16 TRANSPORTATION VIA MATS																																																			
17 SPECIAL HANDLING																																																			
18 CONTAINERS RECEIVED EXCEPT AS NOTED																																																			
19 QUANTITIES RECEIVED EXCEPT AS NOTED																																																			
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SHIPPING CONTAINERALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT										SHEET NO. OF SHEETS 02 03		5 REQUISITION DATE		6 REQUISITION NUMBER	
SURE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND										7 DATE MATERIAL REQUIRED		8 PRIORITY			
9 AUTHORITY OR PURPOSE (CORRUSSION (UNIT) SHIP SIMA (PS))										10 SIGNATURE		11 A VOUCHER NUMBER AND DATE			
12 DATE SHIPPED										13 MODE OF SHIPMENT		14 BILL OF LADING NUMBER			
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.										16		17			
4 APPROPRIATE AND SUBHEAD	OBJ CL	SUBAL LOT	SUR CONT NO	AUTHORIZATION ACT G ACTIVITY	TRANS TYPE	PROPERTY ACT G ACTIVITY	COUN TRY	COST CODE	AMOUNT	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER NOS (f)	UNIT PRICE (h)	TOTAL COST (i)	
GENERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)															
N AL SIZE UNC COST CODE THREAD															
01	2	16			EA					210					
02	1	13			EA					55					
03	1	12			EA					55					
04	1	11			EA					400					
05	1	10			EA					150					
16 TRANSPORTATION VIA MATS CHARGEABLE TO															
17 SPECIAL HANDLING															
18 TOTAL CONTAINER															
19 TOTAL WEIGHT															
20 TOTAL CUBE															
21 CONTAINERS RECEIVED BY DATE															
22 QUANTITIES RECEIVED BY DATE															
23 POSTED															
24 RECEIVERS VOUCHER NO															
25 TOTAL															

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

ORIGINAL

SHIPPING CONTAINERALLY → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

1 FROM		2 TO		3 SHIP TO		4 APPROPRIATE AND SUBHEAD		5 OBJ CL		6 BUR CONT NO		7 SUBAL LOT		8 AUTHORIZATION ACCT G ACTIVITY		9 TRANS TYPE		10 PROPERTY ACCT G		11 COUN TRY		12 COST CODE		13 AMOUNT	
<p>REQUISITION AND INVOICE/SHIPPING DOCUMENT</p> <p>SURE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND</p>																									
<p>16 REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.</p> <p>THREE SOURCES OF SUPPLY ARE PROVIDED:</p> <p>FALCON METAL CORP. STOCK EXCHANGER 10715 John Price Road P.O. Box 249 Dept. T Canton, TX 75103 P.O. Box 7429 PH: 214-848-8561 Charlotte, NC 28217 1-800-438-0332</p> <p>SAWSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845</p>																									
<p>17 SPECIAL HANDLING</p>																									
<p>18 TRANSPORTATION VIA MAYS</p>																									
<p>19 RECEIPT</p>																									
<p>20 RECEIVERS VOUCHER NO</p>																									

SHIPPING CONTAINERALLY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PUGET SOUND

(CORROSION CONTROL SHOP SIMA(PS))

1. NAME OF THE BUYER FOR

2. APPROVED BY AND SUBHEAD

3. FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)

FINISH PLAIN WASHERS. THE WASHERS SHALL BE MADE OF 30 OR MEDIUM CARBON STEEL IN ACCORDANCE WITH SAE-GRADE 30. THE WASHERS SHALL BE FREE FROM BURRS, LOOSE SCALE, RP EDGES AND ALL OTHER DEFECTS THAT MIGHT AFFECT THEIR SERVICEABILITY. THEY SHALL HAVE A SURFACE FINISH PRODUCED IN ACCORDANCE WITH ASTM A 380-78. THE WASHERS SHALL BE FURNISHED WITHOUT AN ADDITIVE CHEMICAL OR ALLIC FINISH AND SHALL BE INDIVIDUALLY MARKED WITH MATERIAL GRADE. STAMPING SHALL BE PERMANENT AND BE RAISED OR DEPRESSED. STAMPING SHALL BE MADE WITH A LOW STRESS STAMP. WASHER DIMENSIONS SHALL BE IN ACCORDANCE WITH TABLE 1A OF ANSI B18.22.1 - 1965, PLAIN WASHERS.

16. TRANSPORTATION VIA MATS CHARGEABLE TO

17. SPECIAL HANDLING

ST	DESCRIPTION	TOTAL CONTAINER	TYPE CONTAINER	TOTAL WEIGHT	RECEIVED	DATE	ST	RECEIVED	DATE	ST	RECEIVED	DATE
ST					CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	ST	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE	ST	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE
ST					QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	ST	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE	ST	QUANTITIES RECEIVED EXCEPT AS NOTED	DATE
ST					POSTED	DATE	ST	POSTED	DATE	ST	POSTED	DATE
				TOTAL	SHEET TOTAL				SHEET TOTAL			

← TOTAL →

SHIPPING CONTAINERIALITY 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUFFET SOUND

9 AUTHORITY OR PURPOSE
CORROSION (UNIFORM SHIP SIMA(PS))

10 SIGNATURE
11 VOUCHER NUMBER AND DATE

12 DATE SHIPPED

13 MODE OF SHIPMENT

14 BILL OF LADING NUMBER

15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO

16 ACTION AND SUBHEAD

PROPERTY ACTIVITY

COUN TRY

COST CODE

AMOUNT

FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

UNIT

QUANTITY REQUESTED

SUPPLY ACTION

TYPE CON TAINER

UNIT PRICE

TOTAL COST

MINIMAL WASHER
SIZE

COST CODE

01 /8

EA 400

02 /2

EA 300

03 /16

EA 110

04 /8

EA 650

05 /4

EA 300

17 SPECIAL HANDLING

18 CONTAINERS RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

19 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

20 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

21 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

22 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

23 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

24 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

25 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

26 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

27 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

28 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

29 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

QUANTITIES RECEIVED

DATE

30 TOTAL COMBINED

DATE

QUANTITIES RECEIVED

DATE

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31 TOTAL COMBINED

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32 TOTAL COMBINED

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DD FORM 1149 (9 PT)

REPLACES EDITION OF 1 MAY 58 WHICH MAY BE USED

S/N 0102 LP 011 1801

ORIGINAL

SHIPPING CONTAINERALLY — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT									
SURE INTERMEDIATE MAINTENANCE ACTIVITY PUFFET SOUND									
NAME FOR									
1. AUTHORITY OR PURPOSE									
CORROSION CONTROL SHOP SIMA(PS)									
10. SIGNATURE									
11. VOUCHER NUMBER AND DATE									
12. DATE SHIPPED									
13. MODE OF SHIPMENT									
14. BILL OF LADING NUMBER									
15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.									
PROPERTY ACTIVITY									
COST CODE									
AMOUNT									
FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES									
(b)									
REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.									
THREE SOURCES OF SUPPLY ARE PROVIDED:									
FALCON METAL CORP. STOCK EXCHANGER 10715 John Price Road P.O. Box 249 Canton, TX 75103 Dept. T P.O. Box 7429 Charlotte, NC 28217 1-800-438-0332									
SAWSON INDUSTRIES, INC. 3440-A Overland Ave. Los Angeles, CA 90034 213-559-3845									
16. TRANSPORTATION VIA MATS									
17. SPECIAL HANDLING									
18. RECEIPT									
19. RECEIPT									
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REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHURE IMMEDIATE MAINTENANCE ACTIVITY PULP SOUND

COMITY OR PURPOSE
(S1)WIS (JOIS (CALINT) NOIS(RPHO)
(S1)WIS (JOIS (CALINT) NOIS(RPHO)

WARRANT FOR

APPROVED FOR RELEASE

AMOUNT

100

FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES

(b)

APPLY CERAMIC COATING IN ACCORDANCE WITH MIL-C-81751B TYPE 1 CLASS TO THE SAF-GRADE 2 CARBON STEEL FASTENERS PROVIDED. COATING SYSTEM SHALL CONSIST OF SPECIFIED CERAMIC BASE COAT WITH HIGH TEMPERATURE SEALER (GRAY IN COLOR). APPLICABLE COATING PRODUCTS INCLUDE: SERMETEL SYSTEM; XYLAR 1/XYLAR 101 SYSTEM; OR ALSEAL-518 AND SEAL 598 SYSTEM.

STATION VIA MATS
CHARGEABLE TO

17 SPECIAL HANDLING

CHARGE TO		TOTAL CONTAINER	TYPE OF CONTAINER	DESCRIPTION	TOTAL WEIGHT	TOTAL CUBE	RECEIPT			BY	SHEET TOTAL
TO	BY						DATE	CONTAINERS RECEIVED EXCEPT AS NOTED	DATE		
							QUANTITIES RECEIVED EXCEPT AS NOTED			BY	GRAND TOTAL
							POSTED			BY	TO RECEIVER'S VOUCHER NO.
				<div> <div>←</div> <div>TOTAL</div> <div>→</div> </div>							

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ORIGINAL

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REQUISITION AND INVOICE/SHIPPING DOCUMENT

STRENGTH INTERMEDIATE MAINTENANCE ACTIVITY PROJECT SOUND

NO. OF SHEETS 03	REQUISITION DATE 07	REQUISITION NUMBER
DATE MATERIAL REQUIRED	PRIORITY	
9 AUTHORITY OR PURPOSE (UNION, SIDA, SIMA, PS)		
10 SIGNATURE		
11 VOUCHER NUMBER AND DATE		
12 DATE SHIPPED		
13 MODE OF SHIPMENT		
14 BILL OF LADING NUMBER		
15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.		

PROPERTY ACCT G	COUN TRY	COST CODE	AMOUNT
QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE CON TAINER NOS (f)	UNIT PRICE (h)
UNIT OF ISSUE (c)	TRANS TYPE	AUTHORIZATION ACCT G ACTIVITY	FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)
EA	50	EA	1 1/4"
EA	25	EA	1 1/2"
EA	25	EA	1 3/4"
EA	25	EA	2"
EA	5	EA	2 1/2"
EA	5	EA	3"
EA	10	EA	1 1/2"

PORTATION VIA WATS IS CHARGEABLE TO		17 SPECIAL HANDLING	
TOTAL CONTAINER	TOTAL WEIGHT	TOTAL CUBE	RECEIPT
TYPE CON TAINER	DESCRIPTION	CONTAINERS RECEIVED RECEIVED NOTED	DATE
RECEIVED BY		QUANTITIES RECEIVED RECEIVED NOTED	DATE
RECEIVED BY		POSTED	DATE
TOTAL		SHEET TOTAL	
TOTAL		GRAND TOTAL	
TOTAL		RECEIVERS VOUCHER NO.	

DD FORM 1149 (9-PT) 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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DO NOT WRITE IN THESE SPACES

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REQUISITION AND INVOICE/SHIPPING DOCUMENT									
SHORE INTERMEDIATE MAINTENANCE ACTIVITY RUET SOUND									
1 FROM: 2 TO: 3 SHIP: 4 APPROPRIATE: 5 AUTHORITY OR PURPOSE: 6 REQUISITION NUMBER: 7 DATE MATERIAL REQUIRED: 8 PRIORITY: 9 AUTHORITY OR PURPOSE: 10 SIGNATURE: 11 VOUCHER NUMBER AND DATE: 12 DATE SHIPPED: 13 MODE OF SHIPMENT: 14 BILL OF LADING NUMBER: 15 AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO:									
16 TRANSPORTATION VIA MATS: 17 SPECIAL HANDLING: 18 CONTAINERS RECEIVED EXCEPT AS NOTED: 19 TOTAL CUBE: 20 RECEIVERS VOUCHER NO:									
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15	WAGONAL HEAD BOLTS	9/16-12	3"					EA	15
16	WAGONAL HEAD BOLTS	9/16-12	4"					EA	30
17	WAGONAL HEAD BOLTS	5/8-11	1 1/2"					EA	5
18	WAGONAL HEAD BOLTS	5/8-11	2"					EA	85
19	WAGONAL HEAD BOLTS	5/8-11	2 1/2"					EA	35
20	WAGONAL HEAD BOLTS	5/8-11	3"					EA	165
21	WAGONAL HEAD BOLTS	3/4-10	1 1/2"					EA	40

SHIPPING CONTAINER TALLY — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SURE INTERMEDIATE MAINTENANCE ACTIVITY PUEB SOUND

1. NAME FOR	2. DATE	3. SHEET NO. OF SHEETS 05 07	4. REQUISITION DATE	5. REQUISITION NUMBER
6. AUTHORITY OR PURPOSE (ORIGINATOR UNIT, SLD, SIMA, PS)	7. DATE MATERIAL REQUIRED	8. DATE SHIPPED	9. DATE	10. SIGNATURE
11. VOUCHER NUMBER AND DATE	12. DATE	13. DATE	14. BILL OF LADING NUMBER	15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.

PROPERTY ACCT G	COUN TRY	COST CODE	AMOUNT
TRANS TYPE	AUTHORIZATION ACCT G ACTIVITY	SUBAL LOT	BUR CONT NO
OBJ CL	DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)
SUPPLY ACTION (e)	TYPE COM TAINER (f)	COR TAINER NOS (g)	UNIT PRICE (h)
TOTAL COST (i)			
22	EXAGONAL HEAD BOLTS 3/4-10 2"	EA	25
23	EXAGONAL HEAD BOLTS 3/4-10 2 1/2"	EA	60
24	EXAGONAL HEAD BOLTS 3/4-10 3 1/2"	EA	50
25	EXAGONAL NUTS 3/8-16	EA	210
26	EXAGONAL NUTS 1/2	EA	55
27	EXAGONAL NUTS 9/16	EA	55
28	EXAGONAL NUTS 5/8	EA	400

16. PORTATION VIA MATS IS CHARGEABLE TO	17. SPECIAL HANDLING
18. TOTAL CONTAINER	19. TOTAL WEIGHT
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66. TOTAL WEIGHT	67. TOTAL CUBE
68. TOTAL WEIGHT	69. TOTAL CUBE
70. TOTAL WEIGHT	71. TOTAL CUBE
72. TOTAL WEIGHT	73. TOTAL CUBE
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92. TOTAL WEIGHT	93. TOTAL CUBE
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100. TOTAL WEIGHT	101. TOTAL CUBE

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ORIGINAL

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SHIPPING CONTAINERALLY — 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

REQUISITION AND INVOICE/SHIPPING DOCUMENT

SHORE INTERMEDIATE MAINTENANCE ACTIVITY PUEBT SOUND

MARK FOR

ACTION AND SUBHEAD

OBJ CL

SUB CONT NO

SUBAL LOT

AUTHORIZATION ACCTG ACTIVITY

TRANS TYPE

PROPERTY ACCTG ACTIVITY

COUN TRY

COST CODE

AMOUNT

FEDERAL STOCK NUMBER DESCRIPTION AND CODING OF MATERIAL AND/OR SERVICES (b)

QUANTITY REQUESTED (d)

SUPPLY ACTION (e)

TYPE COM TAINER (f)

CON TAINER NOS (g)

UNIT PRICE (h)

TOTAL COST (i)

REQUEST INDEFINITE DELIVERY CONTRACT BE LET ON THE ABOVE ITEMS.

NO SOURCES OF APPLICATION SERVICES ARE PROVIDED:

EMATECH INTERNATIONAL INC.

126 WEST HOSEBANS AVENUE

WINDALE (L.A.), CA 90260

(13) 973-1142

METALLIC CERAMICS COATINGS INC.

O. BOX 1598

ST QUEST, PA 19380

(15) 279-1212

PORTATION VIA WAYS
IS CHARGEABLE TO

17 SPECIAL HANDLING

18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50						
TOTAL CONTAINER	TOTAL WEIGHT	DESCRIPTION	TOTAL CUBE	CONTAINERS RECEIVED EXCEPTAS NOTED	DATE	BY	SHEET TOTAL																								SHEET TOTAL							
				QUANTITIES RECEIVED EXCEPTAS NOTED	DATE	BY	GRAND TOTAL																								GRAND TOTAL							
				POSTED	DATE	BY	20 RECEIVERS VOUCHER NO																								20 RECEIVERS VOUCHER NO							
TOTAL																															TOTAL							

DD FORM 1149 (9-PT) 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

THIS FORM IS OBSOLETE AND MAY BE USED

S/N 0102 17 015 1801

ORIGINAL

APPENDIX C

DRAFT PROCESS INSTRUCTION:

WIRE-SPRAYED ALUMINUM (WSA) FOR CORROSION PROTECTION:
NAVSEA CC SYSTEMS 1 AND 2

No.: _____

Effective: _____

Cancels: _____

D R A F T

PROCESS INSTRUCTION

**Shore Intermediate Maintenance Activity
Puget Sound**

**TITLE: WIRE-SPRAYED ALUMINUM (WSA) FOR CORROSION
PROTECTION; NAVSEA CORROSION-CONTROL (CC) SYSTEMS 1
AND 2**

SECTION:	I	EQUIPMENT	V	OPERATOR TRAINING
	II	MATERIAL		AND CERTIFICATION
	III	SAFETY	VI	METHOD
	IV	QUALITY CONTROL	VII	FEEDBACK

ORIGINATOR:

APPLICABLE SHIP TYPES: ALL

REASON FOR REVISION:

APPROVALS:

DATE

ORIGINATOR:	_____
PLANNING:	_____
REPAIR OFFICER:	_____
PRODUCTION:	_____
SAFETY:	_____
QUALITY ASSURANCE:	_____
ENGINEERING:	_____

REVIEW: ANNUALLY OR WHENEVER DCD-STD-2138(SH) IS CHANGED.

LEAD SHOP: CORROSION-CONTROL SHOP 71A

SCOPE:

The scope of this process instruction covers the required equipment, safety, quality control, personnel training/certification and application process (method) for applying wire-sprayed aluminum coatings (NAVSEA Corrosion Control (CC) Systems 1 and 2, for high-temperature or low-temperature service, respectively). This includes the application of the required paint coatings (NAVSEA CC System 3). Procedures are in accordance with DoD-STD-2138(SH) (Ref. A) to follow the guideline set forth in the NAVSEA Ship Class Corrosion Control Manuals (Ref. B).

REFERENCES:

- A. DoD-STD-2138(SH), Metal-Sprayed Coating Systems for Corrosion Protection Aboard Naval Ships, 23 November 1981.
- B. NAVSEA Corrosion-Control Manuals for Ship Classes AO-177, CG-16, DD-963, FF-1052, FFG-7, LHA-1, LPD-4, LPH-2 and LST-1179.
- C. Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) Revision 11 March 1983.
- D. NAVSEA S9086-VD-STM-000/CH-631, Preservation of Ships in Service (Surface Preparation and Painting), April 1981.
- E. National Fire Protection Association (NFPA) Standard 33, Spray Application Using Flammable and Combustible Materials, 1985.
- F. CC-Shop Technician Training Curriculum in the SQIP Format, ISA(WC)-110, April 1986.
- G. NAVSEA 0655-AA-JPA-010, Job Performance Aid for Metal Sprayed Coating Systems.
- H. Naval Reserve IMA-7 Training Program, Corrosion Control Using Wire Sprayed Aluminum.
- I. METCO, Type 10E Flame Spray Gun Instruction Manual.
- J. MOGUL, TJ-5 Instruction Manual.

SECTION I

EQUIPMENT

1.1 EQUIPMENT LIST

The following list gives the process sequence, generic equipment description and manufacturer for the equipment associated with the WSA process for SIMA Puget Sound.

PROCESS SEQUENCE	EQUIPMENT DESCRIPTION
Precleaning	Vapor Degreaser
Rough-Blasting	Rough-Blasting Booth (10' x 15' x 15')
Rough-Blasting and Anchor-Tooth Blasting	Testing Sieve, 16-36 mesh
Anchor-Tooth Blasting	Anchor-Tooth Blasting Booth (10' x 10' x 20')
Anchor-Tooth Blasting	Dial Micrometer
Wire-Spray	Waterwash Spray Booth (8' x 6' x 12')
Wire-Spray Wire-Spray and Paint-Spray	Flame Wire-Spray Gun Systems (gun, manifold, wire spool) Dry Film Thickness Gages
Paint-Spray	Waterwash Spray Booth (8' x 6' x 20')
Paint-Spray	Paint-Spray Guns

SECTION II

MATERIAL

2.1 ALUMINUM WIRE

Aluminum wire used for CC Systems 1 and 2 shall conform to the requirements set forth in MIL-W-6712. The wire shall be coated by the manufacturer with special lubricants to aid in wire feed and minimize nozzle wear. The lubricants must not foul the recipient surface nor the sprayed aluminum matrix, leading to corrosion or loss of adhesion. The wire shall be stored and handled carefully and uncoil readily and be free of bends, kinks or burrs that would prevent its passage through the spray gun.

2.2 GASES

Gases used for thermal spraying aluminum wire shall conform to:

<u>GAS</u>	<u>SPECIFICATION</u>
Oxygen	BB-0-925
Acetylene	BB-A-106

2.3 ABRASIVE BLASTING MEDIA

2.3.1 Rough Blasting

Crushed garnet abrasive blasting media with a standard 16-mesh size shall be used to clean painted and corroded metallic surfaces.

2.3.2 Anchor-Tooth Blasting

Aluminum oxide abrasive blasting media with a standard 16- 36-mesh size shall be used to provide anchor-tooth surface profile of 2-3 mils, when measured with profile tape (Testex or equivalent) during final surface preparation of the substrate.

2.3.3 Restrictions

(a) Abrasive particles shall be clean, dry, sharp and free of rust and excessive fines.

(b) Abrasive particles shall not contain any feldspar or other mineral constituents that tend to break down and remain on the surface. Abrasive particles that have been used for cleaning contaminated surfaces shall not be used for final surface preparation, even if the abrasive has been screened.

(c) Abrasive blasting pots and hoses must be clean and uncontaminated. It is advisable to "dedicate" blasting pots and hoses to the anchor-tooth blasting operation.

(d) Prior to use, the crushed garnet and aluminum oxide grit shall pass the following oil contamination test:

- (1) Fill a clean 5-ounce vial or bottle half full of abrasive particles.
- (2) Fill the remainder of the vial or bottle with clean water.
- (3) Cap and shake the vial or bottle.
- (4) Inspect water for oil sheen.
- (5) If any oil is observed, the abrasive particles shall not be used.

This test must be repeated for each reuse of anchor-tooth blasting media.

2.4 PROCESS AIR

Air compressors utilized in the abrasive blasting and thermal spray process shall furnish air which is free of oil and moisture. The air supply shall be adequate to maintain a minimum pressure of 75 lbs per square inch at the blast nozzle. The air shall conform to the requirements of BB-A-1034, with a maximum hydrocarbon content of 0.005mg/liter. Total maximum water content shall be 0.3mg/liter at 20°F.

2.5 MASKING MATERIALS

Any masking material that provides adequate protection of the substrate through both the abrasive blasting and thermal spraying operations without causing substrate corrosion or contamination may be used. Acceptable masking materials include various tapes, plastic caps or plugs, hose sections and wood or metal inserts.

The masking tapes used are:

- (a) 1/2" green duct tape, NSN 8315-00-890-9872.
- (b) 2" green duct tape, NSN 8315-00-074-5100.
- (c) Hi-temp Al foil tape (0.007" thick, 3/4" wide x 36 yd. per roll, Stock No. 06004), T&F Division of SHR Industries, 3660 Edison, Rolling Meadows, Illinois 6008, (312) 392-8090.

2.6 CLEANING SOLVENTS

Toluene conforming to TT-T-548 and trichloroethane conforming to O-T-620C are approved cleaning solvents.

WARNING:

Toluene is flammable. Both toluene and trichloroethane are toxic. Use only in well-ventilated spaces. Do not use near open flames, blasting, thermal spraying work, or sources of sparks. Do not allow prolonged contact with bare skin. Read and follow precautions on container shipping labels before using contents.

2.7 PAINT

2.7.1 CC System 1, High-Temperature Service

Paint applied to items in service above 175°F shall conform to DoD-P-24555, "Paint, Aluminum, Heat Resisting (650°C)."

2.7.2 CC System 2, Low-Temperature Service

Paint applied to items in service below 175°F shall conform to the following:

2.7.2.1 Sealer and Barrier Coats

MIL-P-24441, "Paint, Epoxy-Polyamide, General Specification for, Type II", shall be utilized for sealing the wire sprayed aluminum and providing barrier protection. The paints shall be available in primer green (Formula 150) and haze gray (Formula 151).

2.7.2.2 Topcoats

TT-E-490, "Enamel, Silicone Alkyd Copolymer, Semigloss", shall be used for haze gray topcoats.

TT-E-489, "Enamel, Alkyd", shall be used for white, red, yellow and black topcoats.

DoD-E-699, "Deck Enamel, Formula 20", shall be used for deck gray topcoats on horizontal surfaces.

2.7.2.3 Thinner

TT-E-781, "Ethylene Glycol Monoethyl Ether, Technical (EGM)"; or a 50%/50% mixture of butyl alcohol (TT-B-846) and super high flash naptha (MIL-N-15178), shall be utilized to thin the MIL-P-24441 epoxy paints.

2.8 QUALITY CONTROL

A dial micrometer is used to measure the anchor-tooth surface profile off of the Press-O-Film tape (or equivalent) that had been applied to the surface. The Press-O-Film shall be extra course and may be ordered from Testex, Inc., P. O. Box 867, Newark, Delaware 19711.

SECTION III

SAFETY

3.1 GENERAL

The primary responsibility for safety rests with the individual, non-supervisory personnel who have been assigned to perform the work. The individual's skill level and knowledge of potential hazards is the first guard against unsafe conditions.

The operator's responsibility for safety is shared by his supervisor and all higher levels of management who must ensure that the operator has had the requisite training, is provided sufficient guidance and direction and maintains the required proficiency. In addition, periodic monitoring of all safety requirements should be made to assure they conform to the applicable Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) (Ref. C). Particular attention should be paid to Sections 1910.94, 1910.95, 1910.106 and 1910.107. Detailed safety information is given in DoD-STD-2138(SH), NAVSEA S9086-VD-STM-000, Chapter 631 (Ref. D) and National Fire Protection Association (NFPA) Standard 33 (Ref. E).

3.2 PRECLEANING SOLUTIONS AND SOLVENTS AND THINNING SOLVENTS

When naval personnel use alkaline cleaners or solvents for precleaning, and solvents for thinning, all applicable sections of NSTM, Chapter 631, Section 2, and the applicable NAVOSH Manual apply. All applicable OSHA rules and regulations and manufacturer's safety instructions shall apply to other industrial activities. Follow all safety precautions given on the shipping containers.

3.2.1 Respiration

Avoid inhalation of all solvent fumes by the use of proper ventilation and charcoal filter respirators.

3.2.2 Skin and Eyes

Avoid all solvent and cleaning solution contact with skin. Wear gloves which are impervious to the liquids as well as safety goggles.

3.3 ABRASIVE BLASTING OPERATIONS

When performing abrasive blasting, the current NAVOSH Manual and Sections 631-2.272 through 631-2.288 apply. Never point a blast nozzle at any part of any human body.

3.3.1 Flammable Residues or Fumes

Prior to any abrasive blasting, items previously containing flammable materials shall be purged of dangerous concentrations and certified safe by a Gas-Free Engineer .

3.3.2 Grounding

Blast hose shall be grounded to dissipate static charges.

3.3.3 Protective Clothing

Face shields with dust hoods or helmets with forced-fed purified air shall be used to protect the eyes, face, chin and neck from airborne particles. Safety glasses or goggles shall be worn by all persons near any blasting operation.

3.4 COMPRESSED GASES

3.4.1 Compressed Air

Compressed air shall be used at pressures recommended by the equipment manufacturers. Compressed air shall not be used to clean clothing.

3.4.2 Compressed Oxygen and Acetylene

3.4.2.1 Daily Inspection

Inspect all gas equipment daily for leaks and loose connections.

3.4.2.2 Keep Gas Cylinders Safe

Consider all charged gas cylinders as potentially dangerous. Always secure the cylinders to keep them from toppling. When the cylinders are not in use, shut off gas. Keep cylinders away from heat. Any cylinders that are not installed on the manifold, must have their valve caps in place.

3.4.2.3 Ventilation

Before opening any of the gas valves, always provide adequate ventilation of the work area.

3.5 WIRE SPRAY PROCESS

3.5.1 Manufacturer's Recommendations

Wire spray guns shall be maintained according to the manufacturer's recommendations. At least one copy of each gun type's operating manual must be kept on file at the Shop.

3.5.2 Ignition

Do not ignite the gun without having the wire in the nozzle. If ignited without the wire, a flame may flashback and damage the gun and injure the operator. Do not use matches for ignition. Use only a friction lighter, pilot light or arc igniter.

3.5.3 Personal Protection

3.5.3.1 Metallic Poisoning

Never permit metallic spray dust to enter the eyes, mouth, cuts, scratches or open wounds. After spraying, wash hands thoroughly.

3.5.3.2 Flame-Resistant Clothing

Flame-resistant clothing shall be used and leather or rubber gauntlets shall be worn. The clothing should be strapped tightly around ankles and wrists to prevent metallic dust contact.

3.5.3.3 Hearing Protection

Double hearing protection shall be worn by all operators and attendant personnel, unless otherwise specified by SIMA Safety Department after a decibel level check.

3.5.3.4 Eye Protection

Goggles or face shields shall be worn for protection against dust and intense light from the wire spray operation. Flame wire spraying requires the use of light filter shades 2-4. Arc wire spraying requires shades 11-12.

3.5.3.5 Respiratory

Filter masks shall be worn by the wire spray gun operator during spraying operations. The spray booth must be in operation prior to gun ignition.

SECTION IV

QUALITY CONTROL

4.1 PRODUCTION QUALITY CONTROL RESPONSIBILITY

The following inspection procedures shall be followed by the Shop Quality Control Inspector (SQCI) for all wire sprayed aluminum work accomplished by the Corrosion Control Shop.

4.2 RECEIPT INSPECTION - A receipt inspection shall be accomplished as follows:

(a) Conduct a visual inspection to determine if welding, structural repairs, degalvanizing, removal of prior WSA coatings or further disassembly is required. If repairs are required, notify shop supervisor so item can be routed to applicable shop. If further disassembly is required, advise shop supervisor that further disassembly is required before shop acceptance.

(b) Inspect Ship-to-Shop Tag (Enclosure 1) attached to the item for completeness and give Part 3 to the ship's representative.

(c) Utilize a Production Control Record (Enclosure 2) for each lot of similar items on the SIMA Job Order. Assign a Production Control Number from the Production Control Work Log. Enter this number in the serial number block of the Ship-to-Shop Tag. The Production Control Number will consist of:

- o The letter designation of the IMA.
- o A sequential four-digit number beginning with 0001.

Example: For an item that was coated at SIMA, Puget Sound, a typical production control number would be W-0001.

(d) Attach a metal tag with the Production Control Number stamped on it. After the metal tag is attached, remove the Ship-to-Shop Tag and staple it to the Production Control Record. Release item for precleaning.

(e) Degreasing shall be conducted according to Section 6.2.1. Visually inspect the items to assure that they are free from oil or grease. Release item for masking.

4.3 MASKING INSPECTION - A masking inspection shall be conducted as follows:

(a) Ensure that only high-temperature flame-resistant masking materials and plugs are used.

(b) Visually inspect items to ensure that all areas not to be coated ("fit and function" surfaces and openings) are either masked off or plugged. Ensure masking is tightly adherent to the substrate and to itself when applied in multiple layers. Refer to Section 6.3 for proper masking of dissimilar metal contact areas. Release items for strip blasting.

4.4 STRIP-BLASTING INSPECTION - A strip-blast inspection will be conducted after strip blasting as follows:

- (a) Ensure that all scale, rust and paint has been removed.
- (b) Ensure that all masked areas are still intact. Remask as required.
- (c) Inspect for warpage, cracks, bad welds or over blast. Take corrective action as necessary to correct any discrepancies.
- (d) Take random grit-mesh-size measurements prior to the first daily production run and at the end of the daily production run. Additional measurements may be necessary during the day to assure that the grit is 16-36 mesh in size.

4.5 ANCHOR-TOOTH-BLAST INSPECTION - An anchor-tooth-blast inspection will be conducted after anchor-tooth blasting as follows:

- (a) Visually inspect and ensure that all masked areas are still intact. Remask as required.
- (b) Visually inspect and ensure that all areas of each component in the lot are uniformly blasted to white metal (SSPC-5). Ensure that anchor-tooth-blasted components are handled with clean cloth gloves and rags.
- (c) Measure the anchor-tooth profile at a random location on a minimum of one randomly-selected component from the lot. Use Press-O-Film (x-coarse) and a calibrated dial micrometer thickness gage (MITUTOYO #7326 or equivalent).
- (d) Ensure that anchor-tooth profile is 2 to 3 mils.
- (e) Enter the profile measurement, date and time on the Production Control Record, and initial the Press-O-Film Tab and attach the tab to Production Control Record.
- (f) Sign Production Control Record in Section 4 for the Anchor-Tooth Blast Inspection.
- (g) Ensure that the equipment operators are noting the date and time of their process sequence completion on the Production Control Record.
- (h) Release components to the wire spray work station, ensuring that coating operation is started within four hours after anchor tooth surface preparation. If more than 15 minutes is expected to lapse between the surface preparation and the start of the wire spray process, the prepared anchor-tooth surface shall be protected from moisture, contamination and fingermarks. Wrapping with clean paper will normally provide adequate protection.

4.6 WIRE-SPRAY INSPECTION

4.6.1 Pre-Wire-Spray Process Checks

(a) Permit wire spraying only when the temperature of the steel surface to receive the WSA is greater than the 10°F (5°C) above the dew point. Dew points shall be taken by the WSA operators at the beginning of each shift and recorded in the CC Shop Dew Point Log. The check should be repeated if any significant change in weather occurs (i.e., rain begins). The SQCI should ensure that the log is being kept properly.

(b) Daily, the SQCI shall check the Bend Test Log kept by the WSA operators and that day's test coupons, to ensure that the required process tests were done before starting WSA production.

4.6.2 Post-Wire-Spray Inspection

(a) Ensure that the wire-spray process was started within four hours and completed within six hours after the anchor-tooth surface preparation.

(b) Visually inspect the surface, ensuring that the coating is free of blisters, chips and cracks.

(c) Calibrate the thickness gage (magnetic flux type) before the first measurements in the morning and afternoon, and at random times during the day. The calibration can change due to temperature and handling.

(d) Measure the coating thickness on each item in the lot. Thickness measurements will be taken in at least five random locations, including areas where the item's geometry changes, such as angles and flanges. Wire-spray coating thicknesses shall be:

- o 10-15 mils for high-temperature service (NAVSEA CC System 1).
- o 7-10 mils for low-temperature service (NAVSEA CC System 2).

Note: Components with coating thicknesses below specifications shall receive additional WSA coats. Components with coating thicknesses above 20 mils shall be reblasted to white metal and recoated.

(e) Sign Section 6, WSA Thickness Check, of the Production Control Record. Release item to paint spraying work station.

4.7 SEALER, BARRIER AND TOPCOAT INSPECTION

An inspection of the sealer, barrier and topcoats will be conducted as follows:

4.7.1 High-Temperature Applications (NAVSEA CC System 1)

4.7.1.1 First Coat

Ensure that no more than four hours has elapsed between the wire-spray application and the application of the first coat (sealer coat) of the heat-resistant aluminum paint (DoD-P-24555). **Note: If more than four hours has elapsed since wire spraying, then it is necessary to remove and reapply the WSA.**

4.7.1.2 Second Coat

Ensure that at least eight hours has elapsed since the application of the sealer coat before the second coat of paint is applied.

4.7.2 Low-Temperature Applications (NAVSEA CC System 2)

4.7.2.1 First Coat

Ensure that no more than four hours has elapsed between the wire-spray application and the application of the first coat (sealer coat). The first coat is Formula 150 (green primer) thinned by 50% (volume) with added solvent (EGM). **Note: If more than four hours has elapsed since wire spraying, then it is necessary to remove and reapply the WSA.**

4.7.2.2 Second Coat

Ensure that at least eight hours but not more than 72 hours has elapsed between the application of the sealer coat and the second coat. The second coat is a barrier coating of full strength Formula 150 (green primer).

4.7.2.3 Third Coat

Ensure that at least eight hours but not more than 72 hours has elapsed between the application of the third coat and the second coat. The third coat is a barrier coating of full strength Formula 151 (gray).

4.7.2.4 Fourth Coat

Ensure that a minimum of 24 hours elapsed between the application of the third and fourth coats. The fourth coat is a topcoat of alkylid paint (TT-E-489 or TT-E-490) for vertical components or Formula 20 for horizontal components.

4.7.2.5 Fifth Coat

Ensure that a minimum of 24 hours elapsed between the application of the fifth and fourth coats. The fifth coat is of the same paint formulation as the fourth coat.

4.8 FINAL COATING THICKNESS INSPECTION ON ALL SIMILAR ITEMS IN JOB ORDER

(a) Ensure that a minimum of 24 hours has elapsed since the application of the final topcoat.

(b) Visually inspect the surface of each item, ensuring it is free of holidays, cracks or runs. Under no circumstances should any green primer be visible.

(c) Measure the total coating thickness (with a magnetic type thickness gage) on each item in the Job Order, ensuring that the required coating thickness was attained. Total coating thicknesses must be:

o 13-18 mils for high-temperature service (NAVSEA CC System 1).

o 17-20 mils for low-temperature service (NAVSEA CC System 2).

If any items do not meet the coating total thickness requirements, but previously met the WSA thickness requirements, then more topcoat paint must be applied.

(e) When all items in the Job Order have the required coating thicknesses, sign Section 14 of the Production Control Record.

(f) Release items to final assembly and packaging area.

4.9 FINAL ASSEMBLY INSPECTION

A final assembly inspection will be conducted as follows:

a Ensure that all masking and plugging material is removed.

(b) Ensure that, if required, installation kit and instructions are complete and are attached.

(c) Ensure that item is properly protected and stowed in such a manner as to protect all coated surfaces during transport.

4.10 ABRASIVE BLAST MEDIA INSPECTION

The SQCI shall be responsible for the inspection of all new and used abrasive blast media for both the rough blasting and anchor-tooth blasting operations. The actual inspection may be performed by another assigned CC Shop Technician, but daily reports must be provided to the SQCI.

(a) All new shipments of crushed garnet (16 mesh) and aluminum oxide (16-36 mesh) must be sampled and tested to assure that they comply with restrictions "A" and "D" of Section 2.3.3.

(b) The crushed garnet utilized in the rough blaster shall be checked at each cycle through the pressure pot for excessive fines by using a 36 mesh screen on the sample. If excessive fines exist (50% by volume), then the media must be replaced.

(c) The aluminum oxide utilized in the anchor-tooth blaster shall be checked at each cycle through the pressure pot for excessive fines by using a 36-mesh screen and tested for oil contamination according to part "D" of Section 2.3.3.

SECTION V

OPERATOR TRAINING AND CERTIFICATION

5.1 TRAINING

SPMA CC Shop personnel shall be trained and certified for applying the WSA CC Systems 1 and 2. Course completion and certification requires passing written examination and applying the WSA coating to test panels and test shapes in accordance with DoD-STD-2138.

The major training source documents are:

- o DoD-STD-2138(SH) (Ref. A);
- o NAVSEA 0655-AA-JPA-010, Job Performance Aid for Metal Sprayed Coating Systems (Ref. G);
- o Naval Reserve IMA- Training Program, Corrosion Control Using Wire-Sprayed Aluminum (Ref. H);
- o Equipment Manufacture Operator and Field/Factory Maintenance Instructions; and
- o This Process Instruction.

5.2 CERTIFICATION OF OPERATORS

Section 5.4 of DoD-STD-2138(SH) (Ref. A) applies; the applicable information is summarized below:

- o **Certification Test Requirements**

(Test Panels: Four 2" x 3" x 0.050" wire sprayed 7-10 mils thick.)

- (1) **Visual Examination**

- (a) Inspect for uniform appearance and complete absence of:

- o blisters,
 - o cracks,
 - o chips or loosely-adhering particles,
 - o oil or other internal contaminants, and
 - o pits exposing the undercoat or substrate.

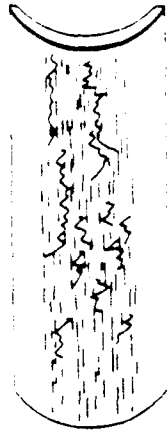
- b. Ensure aluminum modules do not exceed 0.045" diameter by 0.025" high.

(2) **Bend Test**

- o Bend sprayed panels 180° on a 1/2" diameter rod with WSA coating on the outer radius.
- o Visually examine for no disbonding, delamination or gross cracking of the coating due to bending. Small hairline cracks or alligatoring of the coating in the vicinity of the bend are permissible. Acceptable and non-acceptable bend test results are illustrated below:



IDEAL
(Smooth)



MARGINAL
(Cracks)



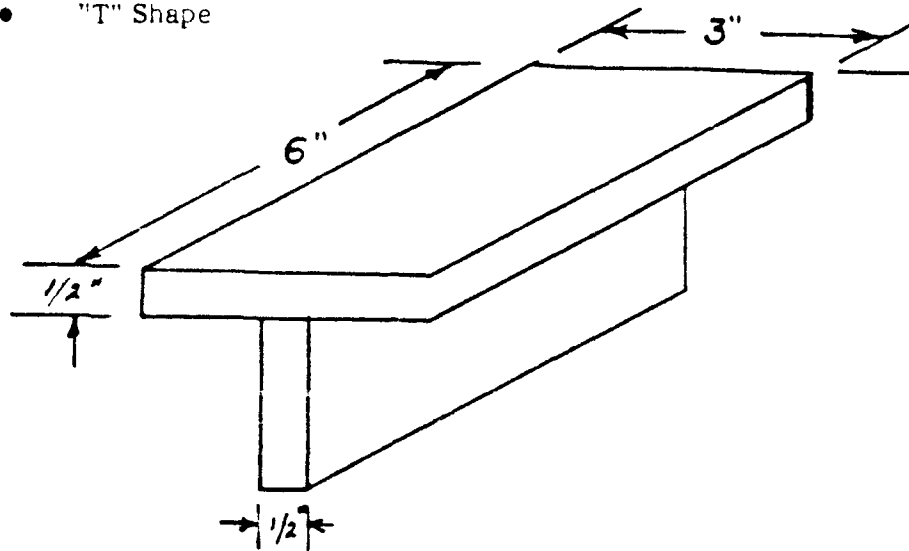
REJECT
(Disbonding)

(3) **Bond Test**

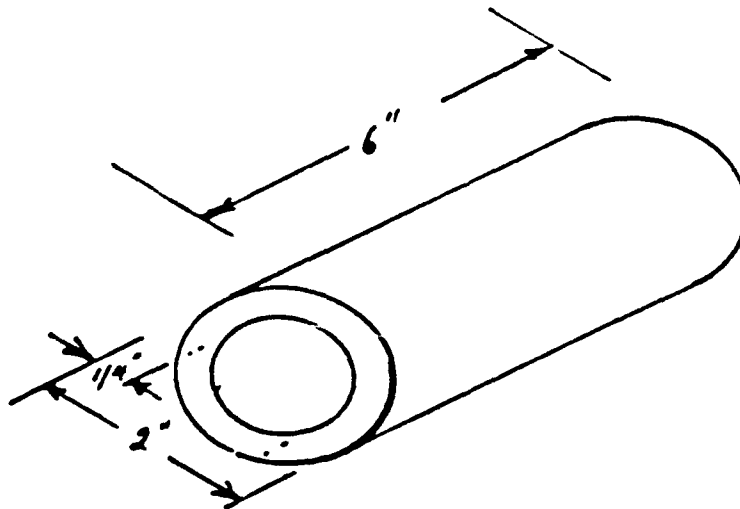
- o Conduct a bond test of five 1" diameter x 1" long steel fixtures in accordance with ASTM C633. The average bond strength must be greater than 2000 psi, with no bond strength less than 1500 psi.

(4) Shape Test

- "T" Shape



- "Pipe" Shape



- The "T" and "pipe" shapes must be coated with 7-10 mils WSA and pass the coating thickness and visual examination.

SECTION VI

METHOD

6.1 SHIP EQUIPMENT/COMPONENTS RECEIPT

Acceptance by the CC Shop of ship equipments/components for processing shall be accomplished by the Shop Petty Officer assigned to tracking the production status of work accomplished by the Shop and work in conjunction with the SQCI. Refer to Section 4 for responsibilities of the SQCI during product receipt. Initiate a Production Control Record for each SIMA Job Order.

6.1.1 Receipt Requirements

(a) Only ship items which are noted in the SIMA Job Order shall be accepted.

(b) Only items which have been properly disassembled to their smallest removable components shall be accepted.

(c) Components which arrive damaged will not be accepted and must be rerouted by the ship for repair or replacement.

6.2 PRECLEANING

Prior to any masking, blasting or spraying, surfaces shall undergo the following:

6.2.1 Degreasing

Surfaces that have come in contact with oil or grease shall be solvent cleaned. Solvents shall be in accordance with Section 2.6. Cleaning should be accomplished by vapor degreasing, but may also be performed by wiping and brushing.

6.2.2 Additional Cleaning

After solvent cleaning, if surfaces still have deposits that may cause disruptive contamination of the blasting grit, they may be cleaned with trisodium phosphate solution, rinsed with clear, potable water and dried.

6.2.3 Preliminary Determination of Possible Heat Cleaning, Degalvanizing or Dealuminizing Requirements

The items should be checked to determine if any additional surface preparation will be required before abrasive rough blasting.

6.2.3.1 Heat Cleaning - Porous materials that were heavily soaked in oils or greases require heat cleaning.

6.2.3.2 Demetallizing - Metals that have been coated with zinc or aluminum during manufacture must be demetallized in a facility with a caustic dip tank. Determine if any aluminum or zinc coatings are present on the component by scraping off paint (with a knife) down to bare metal. Then use a calibrated coating thickness gage (magnetic type) to determine if there is a layer of nonmagnetic coating (i.e., zinc or aluminum) present. The gage should indicate near zero if no metal coating exists.

6.3 MASKING

6.3.1 General

- (a) Refer to Section 2.5 for proper masking material.
- (b) Mask all areas which may be adversely affected by abrasive blasting or metal spraying.
- (c) Tightly apply two layers of tape with the second layer at right angles to the first.
- (d) When masking around dissimilar metals, such as brass wedges or bushings on steel components, apply the masking tape so that the WSA will be applied 1/4-inch onto the periphery of the dissimilar metal.
- (e) Inspect masking for damage between the abrasive blasting and metal spray process and replaced if damaged.

6.3.2 Required Masking

The following surfaces shall be properly masked or plugged:

- (a) Machined surfaces that are required to move with respect to each other, such as threads, bearing contacts, gear teeth and slides.
- (b) Surfaces related to component alignment, proper seating and mountings, such as flange faces, counterbores and keyways.
- (c) Electrical assemblies, such as contacts, relays and insulators.

6.4 STRIP BLASTING

Items shall be strip blasted to remove all old paint and corrosion products.

- (a) Utilize 16-mesh abrasive grit. Refer to Section 2.3.1 for strip blasting material.
- (b) Exercise care when abrasively blasting thin gage metals to prevent product warping or any other damage.

(c) Remain alert for any warpage, cracks, bad welds or excessive metal removal. Any items exhibiting this type of damage shall receive the necessary repairs before continuing further in the process. Minor repairs shall be accomplished by the CC Shop or by the applicable Repair Shop, utilizing a "hard card". Major repairs require contacting the SIMA Planner to obtain a Job Order Supplement for repair work by the applicable Shop.

(d) Refer to Section 4.4 to assist the SQCI.

(e) After abrasive blasting, the items shall be cleaned of all grit and dust by using an air gun and lint-free rag.

6.5 HEAT CLEANING, DEGALVANIZING OR DEALUMINIZING WHEN NECESSARY

Components requiring heat cleaning for entrapped oils in porous surfaces or removal of previously failed metallic coatings may now be processed.

6.5.1 Heat Cleaning

(a) To remove oil and grease contamination from porous surfaces, the parts shall be heated in a vented electric oven for at least four hours.

(b) Only items being degreased may be in the oven at the same time.

(c) Steel alloys may be heated to 600°F. Aluminum alloys, except age-hardened alloys, may be heated to 300°F.

6.5.2 Demetallizing

The removal of metallic coatings is most easily accomplished through chemical baths, and is therefore recommended. The coatings can be removed by rough abrasive blasting, but this will more than double the manhour and material requirements of the operation.

6.5.2.1 Degalvanizing

Zinc coatings that have suffered appreciable failure must be removed in an acid dip tank through an authorized service activity.

6.5.2.2 Dealuminizing

Aluminum coatings that have suffered appreciable failure must be removed in a caustic dip tank through an authorized service activity.

6.6 ANCHOR-TOOTH ABRASIVE BLASTING

Anchor-tooth blasting is conducted to guarantee the presence of a surface profile for bonding of the coating and to clean the surface of contamination left by the rough blasting operation. Refer to Section 2.3.2 for material specification requirements.

(a) Items shall be anchor-tooth blasted to a "white metal" finish (SSPC-SP5). A white metal finish is defined as a surface with a gray-white, uniform metallic color, slightly roughened to form a suitable anchor pattern for coatings. When viewed with a 10X magnifying glass, the surface shall be free of oil, grease, dirt mill scale, corrosion products, paint or any other foreign matter.

(b) The abrasive blasting shall be accomplished using clean aluminum oxide grit (10-30 mesh) to ensure that the proper anchor tooth of 2-3 mils is provided. The anchor-tooth profile is measured using Press-O-Film (X-coarse) and a calibrated dial micrometer. The SQCI will be responsible for certifying that the items in the Job Order meet these requirements by random sampling, but the operator must be familiar with the profile test and monitor his/her own work as well.

(c) Care must be exercised to prevent damaging thin-gage items. Anchor-tooth blasting should be conducted as a quick sweep of the surface, not as a metal removal procedure.

(d) After the item has been blasted, it shall be cleaned of all grit and dust by using an air gun and lint-free rags.

(e) The cleaned item shall be protected from moisture, contamination and fingerprints. Wrapping with clean paper will normally provide adequate protection. Handle the anchor-tooth blasted items with clean cloth gloves or rags.

(f) Anchor-tooth blast inspection shall be conducted as stated in paragraph 4.5.

(g) The wire spray process must be started within four hours after the anchor-tooth blast, or else the anchor-tooth blast will have to be repeated.

6.7 WIRE SPRAY APPLICATION

6.7.1 Wire Spray Gun Operation

Refer to the operating manuals for the METCO 10E and/or MOGUL TJ5 flame wire spray guns for the application of aluminum. The manuals provide the necessary gas flow rates and maintenance required.

6.7.2 Dew Point Check

Check the steel substrate's surface temperature to assure that no condensation will form due to the relative humidity of the ambient air. If the steel substrate temperature is not 10°F (5°C) above the dew point, no metal spraying shall be conducted.

6.7.3 Daily Sample Coupons

Prior to commencement and once during each day's or shift's production run, a sample coupon shall be prepared by the operator.

(a) Anchor-tooth blast a test coupon with the grit currently in use. The test coupon (3 x 2 x 0.05 inches) shall be sprayed on one of its large faces. The WSA shall be applied 7-10 mils if the production run is for low-temperature applications, or 10-15 mils if the production run is for high-temperature applications.

(b) The test coupon shall be visually examined and shall not contain any: blisters, cracks, chips or loosely-adhering particles, oil or internal contaminants, or pits exposing the substrate.

(c) The sprayed panel shall be bent approximately 180 degrees on 1/2-inch diameter rod. The coating shall be on the outside surface of the bend.

(d) No disbonding, delamination or gross cracking of the coating shall occur due to bending. Small hairline cracks or alligatoring of the coating in the vicinity of the bend are permissible. Figure 6-1 illustrates acceptable and nonacceptable bend test results.

(e) If the coupon fails the test, then the cause of failure must be found and fixed and the test repeated until a coupon passes. This may require checking: the gas cylinder pressures or for any acetone in the flow meters; the drains on the air filter; the anchor-tooth on the coupon; and the grit for breakdown or contamination.

6.7.4 Application of WSA to Ship Components

6.7.4.1 Time Requirement

The metal spray application shall be started within four hours after anchor-tooth surface preparation, and finished within six hours. Continue to note the date and time of the completion of each process sequence.

6.7.4.2 Application

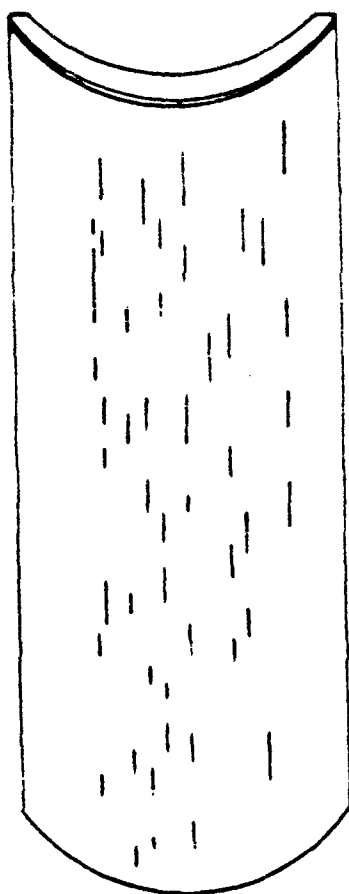
(a) The aluminum coating shall be applied in multiple layers, and in no case shall less than two crossing passes (oriented at right angles to each other) be made over every part of the surface.

(b) The sprayed metal shall overlap by 50% on each pass of the gun to assure uniform coverage.

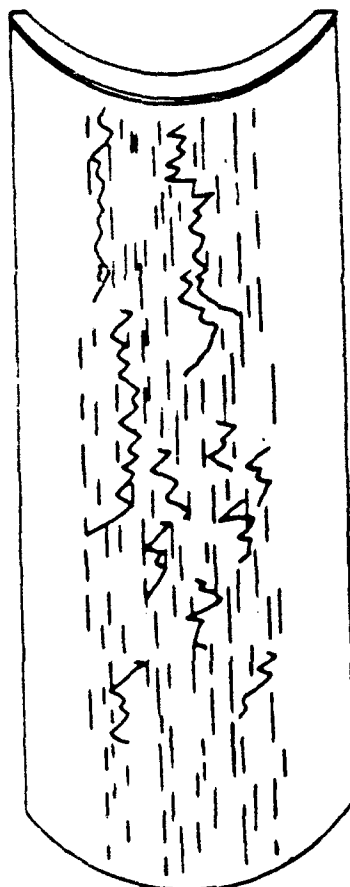
(c) The aluminum coating shall be applied to the required thicknesses of:

- o 10-15 mils for high-temperature service (NAVSEA CC System 1).
- o 7-10 mils for low-temperature service (NAVSEA CC System 2).

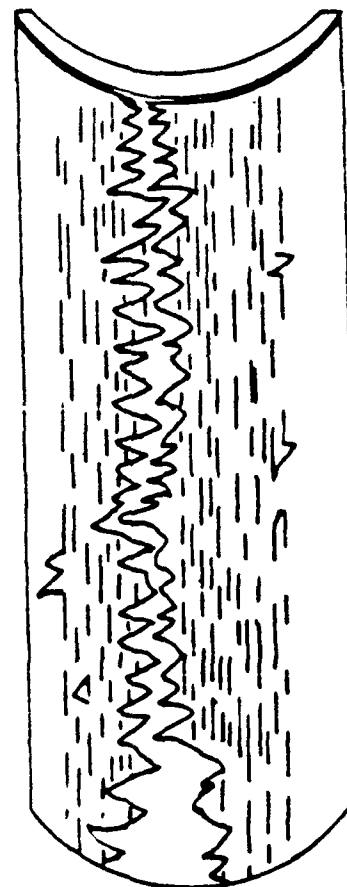
The operator shall make thickness checks during the process to ensure adequate thickness is provided. The operators should be responsible in not allowing any products with thin coats of WSA to pass further along in the process.



IDEAL
Smooth Surface



MARGINAL
Cracks



REJECT
Disbonding
Delamination

Figure 6-1 Coupon Bend Test Accept/Reject Examples

(d) The spray gun shall be held 5 to 8 inches from the surface being sprayed. The angle of the spray stream shall be as close to 90 degrees as possible, and never less than 45 degrees. Utilize gun accessories, such as angle nozzles, to maintain proper spray angles. The operator should study the recipient item before commencing spraying to determine the best plan to follow. Local masking may be necessary to prevent overspray from building up on complex shapes.

(e) Upon completion of spraying, contact the SQCI to certify proper coating thickness on the Production Control Record.

(f) Protect the freshly coated item from moisture, dirt and hand marks. Handle with clean gloves and rags.

(g) The WSA coating shall be sealed within four hours of WSA application to prevent the entrapment of moisture and corrosive salts from the marine atmosphere.

6.8 PAINT APPLICATION

When applying the various paints, the operators shall monitor the wet film thickness to aid in obtaining the specified dry film thickness (DFT). Using a wet film thickness gage, take measurements during each coat. The wet film thickness will be approximately twice as thick as the resultant DFT after drying. Refer to Section 2.7 for paint material specifications.

6.8.1 Application for High-Temperature Components (NAVSEA CC System 1)

Refer to Figure 6-2 for an illustration of this coating system.

6.8.1.1 First Coat (Sealer Coat)

(a) The first coat (sealer coat) shall be applied within four hours after the WSA application.

(b) The sealer paint is the heat-resistant aluminum paint meeting DoD-P-24555.

(c) Apply the paint to obtain a dry film thickness (DFT) of 1.5 mils. The wet film thickness will be approximately 3 mils.

6.8.1.2 Second Coat (Topcoat)

(a) Allow eight hours to pass before applying the second coat of heat-resistant aluminum paint.

(b) Apply another 1.5 mil DFT coat of paint, to obtain a total paint DFT of 3 mils.

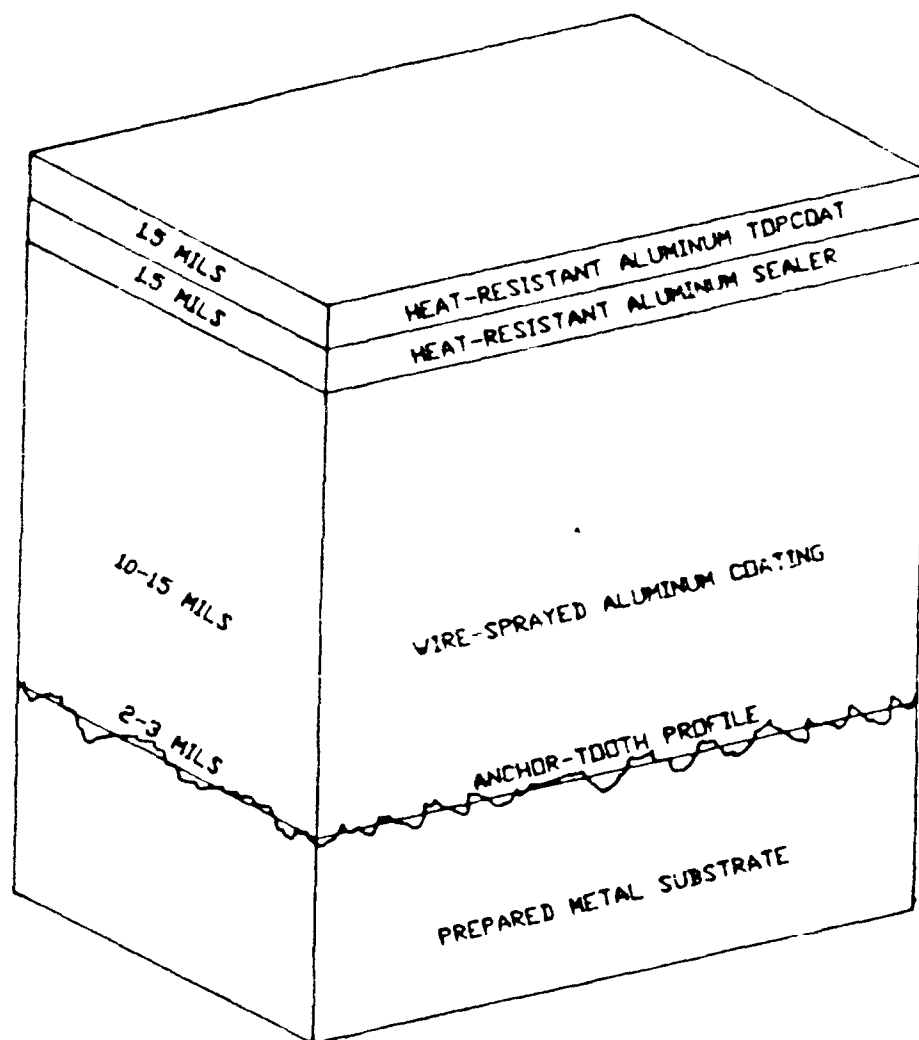


Figure 6-2 NAVSEA CC System 1, WSA With Heat-Resistant Aluminum Paint

6.8.2 Application for Low-Temperature Components (NAVSEA CC System 2)

Refer to Figure 6-3 for an illustration of this paint system.

6.8.2.1 First Coat (Sealer Coat)

(a) The first coat (sealer coat) shall be applied within four hours after the WSA application.

(b) The sealer paint is Formula 150 (green primer) thinned by 30% volume with solvent. Thinning solvent shall be either EGM or another approved solvent.

(c) Apply to a DFT of 0.5 to 0.75 mils, i.e., requires a wet film thickness of 1-1.5 mils.

6.8.2.2 Second Coat (Barrier Coat)

(a) The second coat shall be applied at least eight hours but not more than 72 hours after the first coat was applied.

(b) Utilize full strength Formula 150 (green primer) as the second coat.

(c) Apply enough paint to obtain a 3-mil DFT (i.e., requires a wet film thickness of 6-mils).

(d) Some items, such as doors, hatches and scuttles, may have angle areas that cannot be coated by spray paint. Utilize a painter's 1-1.5" angle brush to coat these areas.

6.8.2.3 Third Coat (Barrier Coat)

(a) The third coat shall be applied at least eight hours but not more than 72 hours after the second coat was applied.

(b) Utilize full strength Formula 151 (gray) as the third coat.

(c) Apply enough paint to obtain a 3-mil DFT.

(d) When hard to spray angle areas are present, utilize a painter's 1-1.5" angle brush to coat these areas.

6.8.2.4 Fourth Coat (Topcoat)

(a) The fourth coat shall be applied after a minimum of 24 hours has elapsed since third coat was applied.

(b) Utilize alkyd paints (TT-E-489 or TT-E-490) meeting the color requirements for the particular ship component for vertical surfaces; and Formula 20 for horizontal surfaces.

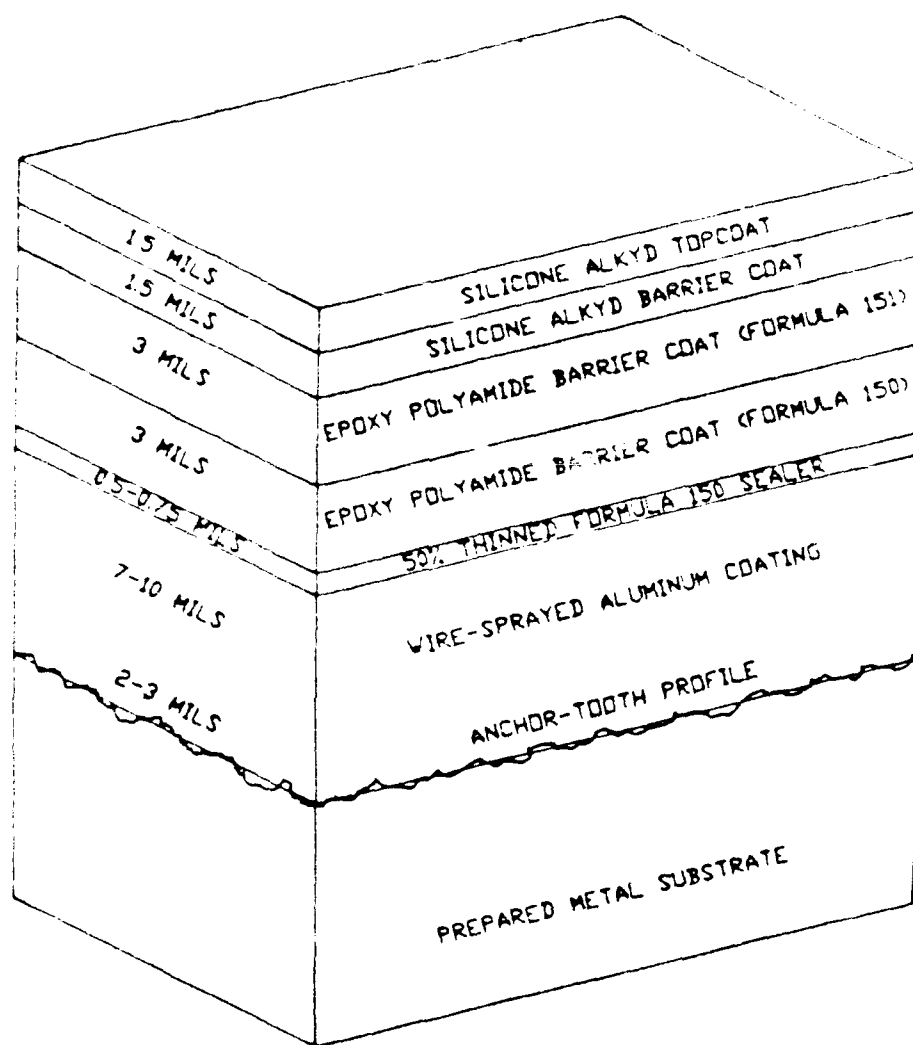


Figure 6-3 NAVSEA CC System 2, WSA With Five-Coat Paint System

- (c) Apply enough paint to obtain a 1.5-mil DFT.

6.8.2.5 Fifth Coat (Topcoat)

- (a) The fifth coat shall be applied after a minimum of 24 hours has elapsed since the fourth coat was applied.
- (b) Utilize the same paint as before (TT-E-489, TT-E-490 or Formula 20) meeting the color requirements of the particular ship component.
- (c) Apply enough paint to obtain a 1.5-mil DFT.
- (d) Allow final coat to dry.

6.9 FINAL COATING THICKNESS INSPECTION

The SQCI officially performs this inspection, but the operators responsible for WSA and paint application should be aware of the results. The operators need to be familiar with any problem areas. Refer to Section 4.8 for inspection procedures. The total coating thicknesses must be:

- o 13-18 mils for high-temperature service (NAVSEA CC System 1).
- o 17-20 mils for low-temperature service (NAVSEA CC System 2).

6.10 FINAL ASSEMBLY


- (a) Remove all masking and plugging material.
- (b) Prepare the required installation kit (i.e., fasteners, anti-seize, sealant and instructions).
- (c) Properly protect item for temporary stowage and transport to customer ship.
- (d) The Shop Petty Officer in charge of production tracking and the SQCI shall agree to final product release.
- (e) Remove and discard the metal identification tag and re-attach Ship-to-Shop Tag.
- (f) Remove Part 2 of Ship-to-Shop Tag and notify Shop Supervisor that item is ready for pickup.
- (g) When Ship's Force picks up item, complete and attach Parts 1 and 3 of Ship-to-Shop Tag to Production Control Record.

SECTION VII

FEEDBACK

In addition to the daily supervision of production and quality control, the following "feedback" indications will be used to monitor and maintain/improve the quality and productivity of the CC Shop:

- o Verbal and written reports from customer ships and shops.
- o Weekly analysis of the CC Shop's:
 - .. Production input to output;
 - .. Labor and materials consumed;
 - .. PM/CM activity;
 - .. QC activity and results;
 - .. Product degradation/failure reports; and
 - .. Operator training/certification.



**SHIP TO SHOP TAG
(GENERAL USE)**

TAG _____ OF _____

SURFGEN QA FORM 9090 4A (1/79)
S N C 16 LF 890 9C20

(PART 1)

SHIP _____

JCN _____

EIC/APL _____ SER NO _____

JOB BRIEF/EQUIP NOMENCLATURE _____

LEAD W/C _____ DATE RECD _____ DELIVERED BY _____

**ATTACH PART 1 AND PART 3 TO COMPLETED WORK REQUEST
AFTER PICK UP BY SHIP**

READY FOR PICK UP TAG **(PART 2)**

SHIP _____

JCN _____

EIC/APL _____ SER NO _____

JOB BRIEF/EQUIP NOMENCLATURE _____

LEAD W/C REP _____ DATE _____

CUSTOMER MATERIAL RECEIPT **(PART 3)**

SHIP _____

JCN _____

JOB BRIEF/EQUIP NOMENCLATURE _____

RECD BY _____ DATE _____

DELIVERED BY _____ DATE _____

**SHIP'S ENGINEER SHALL RETAIN THIS TAG (PART 3) AS RECEIPT
FOR MATERIAL DELIVERED TO THE TENDER.**

Enclosure 1

CORROSION CONTROL SHOP WIRE SPRAYED ALUMINUM PRODUCTION CONTROL RECORD

USS _____
Ship _____ Hull Number _____

Job Control Number (JCN) _____

Production Control Number _____

Item Description _____

Location Deck Frame Side _____

TYPE COATING:

_____ WSA (HT) SYS 1
_____ WSA (LT) SYS 2

FINISH COLOR:

_____ Heat Res. Alum. Paint
_____ Haze Gray
_____ Deck Gray
_____ Other _____

SECTION		PROCESS SEQUENCE	DATE	TIME	SHOP QCI SIGNATURE
1		Receipt, Degrease, Degalvanize or Dealuminize			
2		Masking			
3		Rough Abrasive Blast			
4		Anchor-Tooth Abrasive Blast 2-3 mils			
5		Thermal Spray Operator Name _____			Attach Profile Tape Here
6		WSA Thickness Check SYS 1: 10-15 mils SYS 2: 7-10 mils			
		Seal, Barrier and Top Coat			
		Type/DFT Rgmt	DATE	TIME	
CC SYS 1	7	Heat Res. Alum. Paint/1.5 mils			
	8	Heat Res. Alum. Paint/1.5 mils			
CC SYS 2	9	50% Formula 150/0.5-0.75 mils			
	10	Formula 150/3 mils			
	11	Formula 151/3 mils			
	12	Alkyd Topcoat/ 1.5 mils			
	13	Alkyd Topcoat/ 1.5 mils			
14		Final Coating Thickness on all similar items in Work Order SYS 1: 13-18 mils SYS 2: 11-14 mils			
15		Final Assembly and Packaging			

Enclosure 2

APPENDIX D

DRAFT PROCESS INSTRUCTION:

POWDER COATINGS, ELECTROSTATICALLY APPLIED
NAVSEA CC SYSTEM 4

No.: _____

Effective: _____

Cancels: Original Issue

D R A F T

PROCESS INSTRUCTION

Shore Intermediate Maintenance Activity

Puget Sound

**TITLE: POWDER COATINGS, ELECTROSTATICALLY APPLIED:
NAVSEA CORROSION-CONTROL (CC) SYSTEM 4**

SECTION:	I	EQUIPMENT	V	OPERATOR TRAINING
	II	MATERIAL	VI	METHOD
	III	SAFETY	VII	FEEDBACK
	IV	QUALITY CONTROL		

ORIGINATOR:

APPLICABLE SHIP TYPES: ALL

REASON FOR REVISION: ORIGINAL ISSUE

APPROVALS:

DATE

ORIGINATOR: _____

PLANNING: _____

REPAIR OFFICER: _____

PRODUCTION: _____

SAFETY: _____

QUALITY ASSURANCE: _____

ENGINEERING: _____

REVIEW: ANNUALLY

**LEAD SHOP: CORROSION-CONTROL SHOP
SHOP 704**

SCOPE: The scope of this process instruction covers the required equipment, method or industrial process, safety and quality control required for applying the NAVSEA Corrosion-Control (CC) System 4 (Powder Coatings, Electrostatically Applied) (Ref. A) to ferrous and aluminum-alloy substrates in accordance with the powder manufacturer's recommendations.

REFERENCES:

- A. NAVSEA Corrosion-Control Manual for AO-177, DD-963, FF-1052, FFG-7, CG-16, LHA-1, LST-1179, LPH-2 and LPD-4 Class.
- B. NORDSON, Manufacturer of Electrostatic Powder Coating Equipment, Finishing Equipment Division, D-1 and D-1A Powder Spray Systems.
- C. RANDSBURG-GEMA Electrostatic Powder Coating System, Type 701 and 702.
- D. BAYCO Industries of Ca., Custom Curing Ovens.
- E. American Society for Testing and Materials (ASTM) D-4060, Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
- F. ASTM-D-3359, Standard Methods for Measuring Adhesion by Tape Test.
- G. ASTM-D-870, Standard Method of Water Immersion Test of Organic Coatings on Steel.
- H. NAVSEA S9086-VD-STM-000/CH-631, Preservation of Ships in Service (Surface Preparation and Painting), 15 Apr 81.
- I. ASTM D-3363, Standard Test Method for Film Hardness by Pencil Test.
- J. ASTM-D-2794, Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- K. ASTM-B-117, Standard Method of Salt Spray (Fog) Testing.
- L. Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) Rev. 11 March 1983.
- M. National Fire Protection Association (NFPA) Standard 33, Spray Application Using Flammable and Combustible Materials, 1985.
- N. NFPA Standard 70, National Electrical Code, 1984.
- O. CC-Shop Technician Training Curriculum, in the SQIP Format, ISA(WC)-110, April 1986.

SECTION I

EQUIPMENT

1.1 GENERAL

The equipments specified in this Process Instruction are typical for application of powder coating systems electrostatically applied in an industrial activity. The equipments consists of an electrostatic spray gun, power supply, resin hoppers, (Refs. B and C); dry filter spray booth, resin recovery system (optional), conveyor system (optional) curing oven, (Ref. D); grit-blast booth, grit-blast nozzle and hoses, pressure pots, grit-recovery system (optional), air-purification system, air-dryer system and quality control and safety equipment. A typical equipment layout and production flow diagram is presented in Figure 1-1. A general list of equipment is given in Table 1-1.

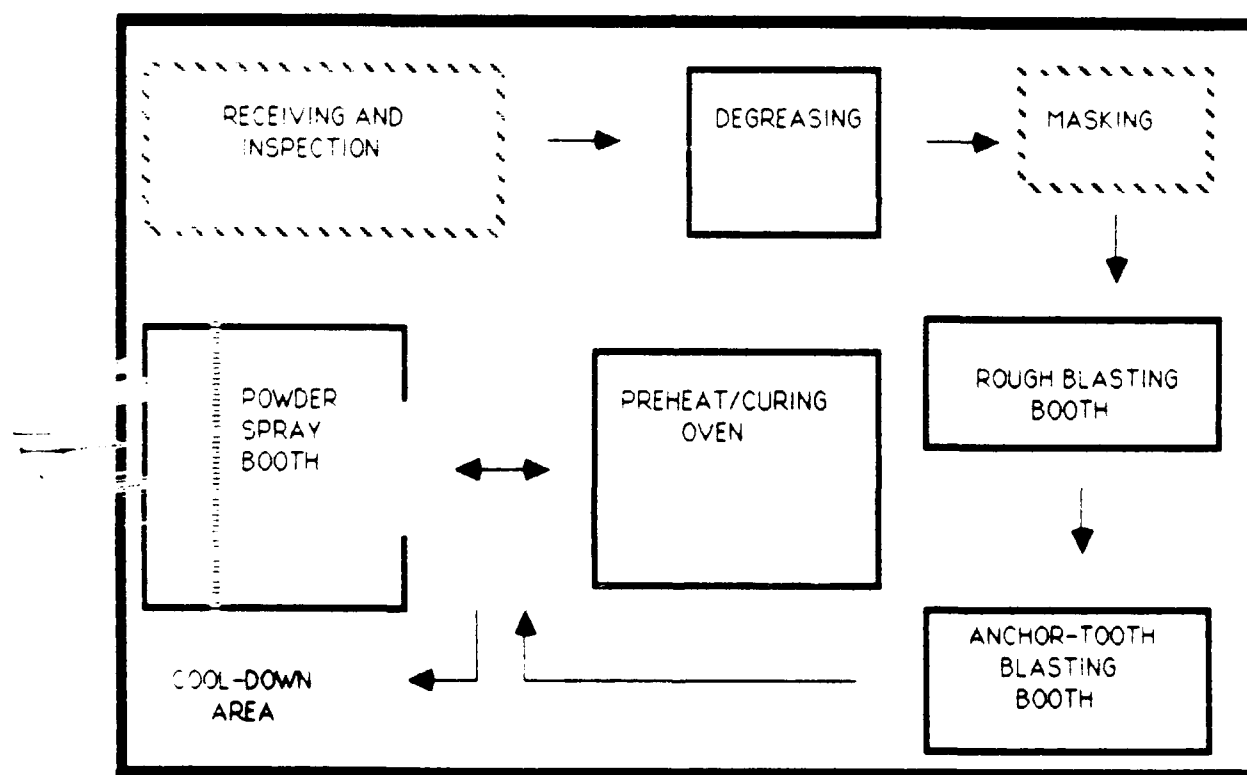


Figure 1-1 Powder Coating Station, Idealized Equipment Layout

Table 1-1 General List of Equipment

SURFACE PREPARATION EQUIPMENT

Degreaser, Vapor
Degreaser, Immersion (optional)
Rough Blaster (booth, pressure pots, cyclone, hoses and nozzles)
Anchor-Tooth Blaster (booth, pressure pots, cyclone, hoses and nozzles)
Dial Micrometer (for surface profile tape)
Testing Sieves (30, 60 and 80 mesh)

COATING EQUIPMENT

Electrostatic Spray Powder System (gun, hoppers and controls)
Spray Booth, dry filter
Preheating/Curing Oven
Curing Racks/Carts on Monorail
Suspension Hooks

QUALITY CONTROL EQUIPMENT

Coating Thickness Gage, magnetic flux type
Coating Thickness Gage, eddy current type
Impact Test Meter, Gardner type (optional)

MISCELLANEOUS EQUIPMENT

Work Tables
Razor Blades and Disposable Knives
Heat-Resistant Gloves and Sleeves
Dust Filter Masks
Leg Stats

SECTION II

MATERIAL

2.1 RESIN

2.1.1 Powdered Epoxy

The powdered epoxy shall consist of a finely divided powder that shall require no blending, mixing or addition of other compounds to effect a cure. The resin shall be thermosetting (oven cured) when applied in film thicknesses from 8 to 12 mils within one to two coats. The cure temperatures and oven time will depend on the component or item weight. Cure temperatures and cure time will also be effected by preheating of the component.

2.1.1.1 Abrasion Resistance

The cured powder coating weight loss shall be less than 60mg per 1000 cycles, when tested in accordance with ASTM-D-4060 (Ref. E) using a Taber abraser with CS-10 wheels and a 1.0 kg load.

2.1.1.2 Adhesion

The cured coating must pass without any lifting of the coating, when tested in accordance with ASTM-D-3359, Method A (Ref. F).

2.1.1.3 Chemical Resistance

The chemical resistance of powder coatings to 24-hour immersion in salt water and fuel oil shall be tested in accordance with ASTM-D-870 (Ref. G), with no resultant blistering, disbonding or softening.

2.1.1.4 Color and Gloss

The color and gloss of the curing coating must be in accordance with that specified for the particular component in NAVSEA S9086-VD-STM-000, Chapter 631 (Ref. H). The color must match the following:

Haze Gray	FED-STD-595-26270	(40-50% gloss)
Red	FED-STD-595-21105	(40-60% gloss)
Yellow	FED-STD-595-23538	(40-60% gloss)
Black	FED-STD-595-27038	(40-60% gloss)
Flat Black	FED-STD-595-37038	(0-10% gloss)
White	FED-STD-595-27875	(40-60% gloss)
White	FED-STD-595-27886	(40-60% gloss)

2.1.1.5 Hardness

The cured coating shall have a pencil hardness of 2H or greater when determined in accordance with ASTM-D-3363 (Ref. I).

2.1.1.6 Impact Strength

The cured coating, at an average thickness of 3-mils, shall be capable of withstanding a mechanical shock load of not less than 100 in/lb, on direct impact, when tested in accordance with ASTM-D-2794 (Ref. J).

2.1.1.7 Overbake Stability

The powder coating shall be able to sustain a 100% overbake without yellowing or any reduction in performance properties.

2.1.1.8 Salt Spray Resistance

The cured coating applied to ASTM-A-370 copper-free hot-rolled carbon steel and given 1000 hours minimum exposure in the salt-spray booth shall have less than 1/4 in creepage from scribe when tested in accordance with ASTM-D-2794 (Ref. K).

2.1.1.9 Shelf Life

The shelf life of the uncured resin shall not be less than one-year from the date of manufacture when stored in original unopened containers below 80°F and 50% \pm 10% relative humidity. **Note:** Storage requires environmental control.

2.2 ABRASIVE BLASTING MEDIA

2.2.1 Rough Blasting for Cleaning

Crushed garnet abrasive blasting media with a mesh size from 30 to 60 shall be used to clean painted, rusted/oxidized metallic surface.

2.2.2 Anchor-Tooth Blasting

Aluminum oxide abrasive blasting media with a 80 mesh size shall be used to provide the anchor tooth of 1 to 2 mils maximum measured with profile tape (Testex, Inc. or equivalent) during final surface preparation of the substrate.

2.2.3 Restrictions

(A) Abrasive particles shall be clean, dry, sharp and free of rust and excessive fines.

(B) Abrasive particles shall not contain any feldspar or other mineral constituents that tend to break down and remain on the surface. Abrasive particles that have been used for cleaning contaminated surfaces shall not be used for final surface preparation, even if the abrasive has been rescreened.

(C) Abrasive blasting pots and hoses must be clean and uncontaminated. It is advisable to "dedicate" blasting pots and hoses to the anchor-tooth blasting operation.

(d) Prior to use, the crushed garnet and aluminum oxide grit shall pass the following oil contamination test:

- (i) Fill a clean 5-ounce vial or bottle half full of abrasive particles.
- (ii) Fill the remainder of the vial or bottle with clean water.
- (iii) Cap and shake the vial or bottle.
- (iv) Inspect water for oil sheen.
- (v) If any oil is observed, the abrasive particles shall not be used.

This test must be repeated for each reuse of anchor-tooth blasting media.

2.3 PROCESS AIR

The air equipment used in the abrasive blasting process and the powder coating process shall furnish air which is free of oil and moisture (maximum of 5 mg/m³ of hydrocarbons) and maximum of 35°F dew point at the maximum flow rate (CFM) and maximum pressure (lb/ft²). The air supply shall be adequate to maintain a minimum pressure of 75 lbs. per square inch (lb/in²) at the blast generator.

2.4 MASKING MATERIALS

Any masking material that provides adequate protection of the substrate through both the abrasive blasting and curing operations without causing substrate corrosion or contamination may be used. Acceptable masking materials include various high temperature tapes, plastic caps or plugs, hose sections or metal inserts.

The masking tapes used are:

- (A) 1/2" Green Duct Tape, NSN 8315-00-890-987Z.
- (B) 2" Green Duct Tape, NSN 8315-00-074-5100.
- (C) Hi-Temp Foil Tape (0.007" thick, 3/4" wide x 36 yd per roll, Stock No. 06004). T&F Division of SHR Industries, 3660 Edison Place, Rolling Meadows, IL 6008, or an equivalent tape able to withstand temperatures up to 450°F.

2.5 CLEANING MATERIALS

2.5.1 Solvents

Ethyl Alcohol (denatured) conforming to 0-E-760, toluene conforming to TT-T-548, and trichloroethane conforming to 0-T-620C are approved cleaning solvents.

WARNING:

Toluene and ethyl alcohol are flammable. Ethanol, toluene and trichloroethane are toxic. Use only in well-ventilated spaces. DO NOT use near open flames, blasting, thermal spraying work or sources of sparks. DO NOT allow prolonged contact with bare skin. Read and follow precautions on container shipping labels before using contents.

2.5.2 Alkaline

The alkaline cleaning agent is made up of three chemicals: tribasic sodium phosphate dedocahydrate; pentahydrate sodium metasilicate, technical grade; and detergent, nonionic, Type II, water soluble (MIL-D-016791, Type I). The solution shall consist of 3 lbs. sodium phosphate tribasic, 3 lbs sodium metasilicate and 3 pts. water soluble nonionic detergent (MIL-D-016791, Type I) in 50 gallons of fresh water. Refer to NSTM Chp. 631, Section 2 for health and safety requirements (Ref. K). In 0.1N concentrations, these materials are extremely caustic and can be harmful to skin, eyes and any body contact. **USE CAUTION!** Read and follow precautions on container shipping labels before using contents.

2.6 QUALITY CONTROL

A dial micrometer is used to measure the anchor-tooth surface profile off of the Press-O-Film tape (or equivalent) that had been applied to the surface. The Press-O-Film shall be extra coarse and may be ordered from Testex, Inc., P. O. Box 867, Newark, Delaware 19711.

SECTION III

SAFETY

3.1 GENERAL

The primary responsibility for safety rests with the individual, non-supervisory personnel who have been assigned to perform the work. The individual's skill level and knowledge of potential hazards is the first guard against unsafe conditions.

The operator's responsibility for safety is shared by his supervisor and all higher levels of management who must ensure that the operator has had the requisite training, is provided sufficient guidance and direction and maintains the required proficiency. In addition, periodic monitoring of all safety requirements should be made to assure they conform to the applicable Federal Occupational Safety and Health Administration (OSHA) Standards and Regulations, (29 CFR 1910) (Ref. L). Particular attention should be paid to sections 1910.94, 1910.106 and 1910.107. Detailed safety information is given in National Fire Protection Association (NFPA) Standards 33 and 70 (Refs. M and N).

3.2 PRECLEANING

When using solvents or alkaline cleaners, all applicable sections of NSTM, Ch. 631 Section 2 and the applicable NAVOSH Manual apply when performed by Naval personnel. All applicable OSHA rules and regulations shall apply to other industrial activities and manufacturer's safety instructions. Avoid inhalation of solvent fumes and contact with skin as much as possible.

3.3 ABRASIVE BLASTING

When performing abrasive blasting, the current NAVOSH Manual and Sections 631-2.272 through 631-2.288 of NSTM Ch. 631 apply for SIMA(SD) personnel. All applicable OSHA rules and regulations apply to other industrial activities.

3.3.1 Flammable Residues or Fumes

If the items previously contained flammable materials, it shall be purged of dangerous concentrations and must be certified safe by a Gas-Free Engineer prior to any abrasive blasting.

3.3.2 Grounding

Blast hose shall be grounded to dissipate static charges.

3.3.3 Protective Clothing

Face shields with dust hoods or helmets with forced-fed purified air shall be used to protect the eyes, face, chin and neck from airborne particles. Safety glasses or goggles shall be worn by all persons near any blasting operation.

3.4 ELECTROSTATIC SPRAY POWDER

3.4.1 Spray Booth

Powder-in-air concentration of greater than 0.05-0.07 oz per cubic foot can be ignited by hot flame or strong electrical discharge. Proper application equipment shall be used to keep powder-in-air concentrations below 0.01 oz/ft³. Spray booths are designed for single gun or multi-gun operation. The use of more guns than as specified for the booth will create a dangerous powder-in-air concentration and so must never be done. The spray equipment shall be interlocked with the booth blower so that no powder may be sprayed when the ventilation is shut off. The work floor of the coating area must be electrically conductive. All metal objects within 15 ft. of spray gun must be grounded. **DO NOT spray near any source of ignition.**

3.4.2 Component Suspension Devices

Hangers shall be clean to assure good electrical ground of component and to avoid static electrical discharge. The component shall be well-grounded (0-300 ohms) when the electrostatic voltage is maintained at 50-100 Kv.

3.4.3 Personnel Precautions

3.4.3.1 Respiration - Personnel operating the spray equipment shall wear respiration masks approved by NIOSH. These powders are classified as "nuisance dust" and are not toxic.

3.4.3.2 Skin Contamination - Personnel should minimize contact with the powdered resin to avoid possible irritation or allergenic reaction. Long sleeve work clothing and cotton paint hoods should be worn. If powder gets on skin, it should be removed with soap and water. Safety glasses or goggles are recommended but not required.

3.4.3.3 Electrical - Personnel in the spray area must wear electrically conductive shoes (e.g., leather soles), or leg stats so that there is less than 50 megohms resistance between themselves and earth ground. The operator should hold spray gun in bare hand. If gloves are worn, the palm should be cut out to assure skin-to-metal contact.

3.4.3.4 Heat - The sprayed component is heat cured to complete coating polymerization. The oven temperatures used are from 325 to 450°F. Personnel handling these components after the cure cycle shall wear heat-resistant gloves and use extreme care to avoid contact with exposed skin areas.

3.4.4 Powder Resin

The Material Safety Data Sheet, Form OSHA-20 or equivalent, must be kept on file for each powder product in Shop files and SIMA Safety Office.

SECTION IV

QUALITY CONTROL

4.1 PRODUCTION QUALITY CONTROL RESPONSIBILITY

The following inspection procedures shall be followed by the Shop Quality Control Inspector for all powder coating work accomplished by the Corrosion Control Shop.

4.2 RECEIPT INSPECTION - A receipt inspection shall be accomplished as follows:

(A) Conduct a visual inspection to determine if welding, structural repairs, removal of prior coatings or further disassembly is required. If repairs are required, notify shop supervisor so item can be routed to applicable shop. If further disassembly is required, advise shop supervisor that further disassembly is required before shop acceptance.

(B) Inspect Ship-to-Shop Tag (Enclosure 1), attached to the item for completeness and give Part 3 to the ship's representative.

(C) Utilize a Production Control Record (Enclosure 2) for each lot of similar items on the SIMA Job Order. Assign a Production Control Number from the Production Control Work Log. Enter this number in the serial number block of the Ship-to-Shop Tag. The Production Control Number will consist of:

- o The letter designation of the IMA.
- o A sequential four-digit number beginning with 0001.

Example: For an item that was coated at SIMA, Puget Sound, a typical production control number would be W-0001.

(D) Attach a metal dog tag with the Production Control Number stamped on it. After the metal tag is attached, remove the Ship-to-Shop Tag and staple it to the Production Control Record.

(E) Release item for precleaning. Free from oil, grease and other contamination. Visual inspection.

4.3 MASKING INSPECTION - A masking inspection shall be conducted as follows:

(A) Ensure that only masking materials and plugs designed to withstand up to 450°F temperature exposure are used for oven operations. The standard green duct tape is sometimes preferred for blasting operations and may be thus used, but it should be replaced with heat-resistant aluminum or fiberglass tape prior to placement of the component into the oven.

(B) Visually inspect items to ensure that all areas not to be coated ("fit and function" surfaces and openings) are either masked off or plugged. Ensure masking is tightly adherent to the substrate and to itself when applied in multiple layers.

4.4 STRIP-BLASTING INSPECTION - A strip-blasting inspection will be conducted after strip blasting as follows:

(A) Ensure that all scale, rust and paint has been removed.

(B) Ensure that all masked areas are still intact. Remask as required.

(C) Inspect for warpage, cracks, bad welds or over blast. Take corrective action as necessary to correct any discrepancies.

(D) Random grit-mesh-size measurements shall be taken prior to the first daily production run and at the end of the daily production run.

4.5 ANCHOR-TOOTH-BLAST INSPECTION - An anchor-tooth-blast inspection will be conducted after anchor-tooth blasting as follows:

(A) Visually inspect and ensure that all masked areas are still intact. Remask as required.

(B) Visually inspect and ensure that all areas at each component in the lot are uniformly blasted to white metal (SSPC-5).

(C) Measure the anchor-tooth profile at a random location on at least one randomly-selected component from the lot, minimum. Use Press-O-Film (x-coarse) and calibrated dial micrometer thickness gage (MITUTOYD #7326 or equivalent).

(D) Ensure that anchor-tooth profile is 1 to 2 mils.

(E) Enter measurement, date and initial the Press-O-Film Tab and attach the tab to Production Control Record.

(F) Sign Production Control Record in Section 4 for the Anchor-Tooth Blast Inspection.

(G) Release to powder coat ensuring that coating operation is started within four hours after anchor tooth surface preparation. If more than 15 minutes is expected to lapse between the surface preparation and the start of the coating process, the prepared anchor-tooth surface shall be protected from moisture, contamination and fingerprints. Wrapping with clean paper will normally provide adequate protection.

(H) Ensure that the equipment operators are noting the date and time of their process sequence completion on the Production Control Record.

4.6 POWDER COAT INSPECTION - A post powder coating inspection will be conducted as follows:

(A) Ensure that the powder application was started within four hours after the anchor-tooth surface preparation.

(B) Visually inspect all components processed with a 10X power magnifying glass. The coating shall be uniform, have no blisters, pinholes, cracks or chips.

(C) The coating's cure shall be checked by lightly tapping the coating with a metal object, such as a putty knife or screw driver. A properly cured coating will be resilient to the metal object. If the coating is brittle and breaks at the point of contact, the coating fails and must be completely removed and reprocessed. Over-cured coatings are typically dull and brittle. If the coating is soft and permanently indented, the object shall be placed in the oven at the curing temperature for another five minutes and again inspected afterwards.

(D) Calibrate thickness gages for ferrous substrates and aluminum substrates at first measurement in the morning and the afternoon. A magnetic flux measurement device is used for non-conductive coatings over mild steel. An eddy-current measurement device is used on non-conductive coatings over aluminum.

(E) Measure each item ensuring that the required coating thickness was attained, 8 to 12 mils. Thickness measurements will be taken in at least five random locations per item. If the coating thickness is unacceptable, the item shall be returned for reprocessing. (Refer to Section 6.10)

(F) Sign Production Control Record in Section 10 Cured Coating Thickness. Record the high and low thickness measurements taken, the date and time.

(G) Release to final assembly area.

4.7 FINAL ASSEMBLY INSPECTION - A final assembly inspection will be conducted as follows:

(A) Ensure that all masking and plugging material is removed.

(B) Ensure that, if required, installation kit and instructions are complete and are attached.

(C) Ensure that items are properly protected and stowed in such a manner as to protect all coated surfaces for the transport from the CC Shop to installation on the customer ship. Make certain that the items are properly stacked/placed on the truck used.

4.8 ABRASIVE BLAST MEDIA INSPECTION

The SQCI shall be responsible for the inspection of all new and used abrasive blast media for both the rough blasting and anchor-tooth blasting operations. The actual inspection may be performed by another assigned CC Shop Technician, but daily reports must be provided to the SQCI.

(A) All new shipments of crushed garnet (30-60 mesh) and aluminum oxide (80 mesh) must be sampled and tested to assure that they comply with restrictions "A" and "D" of Section 2.2.3.

(B) The crushed garnet utilized in the rough blaster shall be checked at each cycle through the pressure pot for excessive fines by using a 60 mesh screen on the sample. If excessive fines exist then the media must be replaced.

(C) The aluminum oxide utilized in the anchor-tooth blaster shall be checked at each cycle through the pressure pot for excessive fines by using an 80 mesh screen and tested for oil contamination according to part "D" of Section 2.2.3.

SECTION V

OPERATOR TRAINING

5.1 TRAINING

SIMA CC Shop personnel shall be trained for applying the NAVSEA CC System 4 by completing the 3-day "CC Shop Electrostatic Spray Powder: Equipment and Application Process Course" (Ref. O). The course covers the theory and practical aspects of powder coating systems; the production process of the powder coating system (receipt inspection/item identification, surface preparation, masking, anchor-tooth blasting, powder spraying and curing; quality control; record keeping; DoD-STD-XXXX; this SIMA Process Instruction; and CC Shop operations (work stations and product flow, productivity and standard times, QC, consumables and supply support.) Approximately 1/3 of the time will be classroom training; 2/3 hands-on shop training in the SIMA CC Shop.

The major training source documents are:

- o NAVSEA Ship Class Corrosion-Control Manuals (Ref. A).
- o DoD-STD-XXXX, Powder Coating Systems for Corrosion Protection Aboard Naval Ships.
- o NAVSEA S9086-VD-STM-000/CH-631 (Ref. H).
- o NFPA Standard 33, Spray Application Using Flammable and Combustible Materials (Ref. M).
- o Equipment Manufacture Operator and Field/Factory Maintenance Instructions.
- o This Process Instruction.

SECTION VI

METHOD

6.1 SHIP EQUIPMENT/COMPONENTS RECEIPT

Acceptance by the CC Shop of ship equipments/components for processing shall be accomplished by the Shop Petty Officer assigned to tracking the production status of work accomplished by the Shop. Refer to Section 4 for responsibilities of the SQCI during product receipt. A Production Control Record is initiated for each SIMA Job Order. The operators must note the time and date of completion of each sequence.

6.1.1 Receipt Requirements

(A) Only ship items which are noted in the SIMA Job Order shall be accepted.

(B) Only items which have been properly disassembled to their smallest easily removed components shall be accepted.

(C) Components which arrive noticeably damaged cannot be accepted and must be rerouted by the ship for repair or replacement.

6.2 PRECLEANING

Prior to any masking, blasting or spraying, surfaces shall undergo the following:

6.2.1 Degreasing

Surfaces that have come in contact with oil or grease shall be solvent cleaned. Solvents shall be in accordance with Section 2.5. Cleaning should be accomplished by vapor degreasing, but may also be performed by wiping and brushing.

6.2.2 Additional Cleaning

After solvent cleaning, if surfaces still have deposits that may cause disruptive contamination of the blasting grit, then they may be cleaned with trisodium phosphate solution, rinsed with clear, potable water and dried.

6.3 MASKING

Refer to paragraph 2.4 for masking material.

(A) All threaded areas must be masked. Only high-temperature tape and plugs designed to withstand up to 450°F shall be used. Any green duct tape utilized for the abrasive blasting operations shall be replaced with high-temperature aluminum foil or nylon tape.

(B) As little masking as possible should be used on items to be powder coated so that as much of the item's surface as possible will be protected by the powder coat.

(C) Inspection of item, reference paragraph 4.3.

6.4 STRIP BLASTING

Refer to paragraph 2.2.1 for strip blasting material. Items shall be strip blasted to remove all old paint and corrosion products.

(A) Care must be exercised where stripping thin gage metals to prevent product warping or any other damage.

(B) Grit sizes of 30-60 mesh shall be used to prevent too large of a surface profile from being made on the surface.

(C) Strip blasting inspection shall be conducted as stated in paragraph 4.4.

6.5 HEAT CLEANING (DEGREASING)

Components with porous surfaces that have entrapped oils or greases shall be heat cleaned in a vented electric oven for four hours at 400°C. Only items being degreased may be in the oven at the same time.

6.6 ANCHOR-TOOTH BLASTING

Anchor-tooth blasting is conducted to guarantee the presence of a surface profile for mechanical bonding by the coating and to clean the surface of contamination left by the strip blasting operation. Refer to paragraph 2.2.2 for material requirement specifications.

(A) Items shall be anchor-tooth blasted to a white metal finish (SSPC-SP5) using clean grit (80 mesh) to ensure that the proper anchor tooth of 1 to 2 mils is provided and that any contamination left from the strip blasting grit is removed. The anchor-tooth profile is measured using Press-O-Film (X-coarse) and calibrated dial micrometer.

(B) Care must be exercised to prevent damaging thin-gage items. Anchor-tooth blasting should be conducted as a quick sweep of the surface, not as a metal removal procedure.

(C) After the item has been blasted, it shall be cleaned of all grit and dust by using an air gun and lint-free rags. Additional cleaning can be accomplished with denatured alcohol.

(D) The cleaned item shall be protected from moisture, contamination and fingerprints.

(E) Anchor-tooth blast inspection shall be conducted as stated in paragraph 4.5.

6.7 PREHEAT

Component preheating is required to both free the object of moisture and provide a hot surface for the powder to build up thickly when applied. Once preheated, the component should be transferred to spray area as quickly and safely as possible.

6.7.1 Thin-Gage Steel and Aluminum. These components shall be preheated for at least 15 minutes at the cure temperature, unless otherwise specified by powder manufacturers.

6.7.2 Steel Castings. Steel castings shall be preheated for one hour at the cure temperature.

6.7.3 Aluminum Castings. Aluminum castings shall be preheated for half an hour at the cure temperature.

6.8 ELECTROSTATIC SPRAY POWDER APPLICATION

Powder coating can be done in a one-coat or two-coat process depending on the type of resin and/or the coating equipment operator. Only personnel familiar with applying the resin correctly should be permitted to coat actual production items. Refer to paragraph 2.1 for material requirement specifications.

6.8.1 Receipt. Coating equipment and booth should be immediately operational upon receipt of preheated item.

6.8.2 Grounding. The components conveying/suspension system must be electrically grounded before electrostatic spray gun is operated.

(A) The suspension of parts from a rack or bar in the spray booth requires: that there be an adequate electrical connection to earth ground; and the point of contact be kept to a minimum because the contact point will not receive any powder.

(B) The wire hooks (typical diameter less than 0.13") used on the small items shall be disposed of after one use.

(C) Large hooks (typical diameter greater than 0.39") shall be checked for adequate metallic contact and periodically grit blasted.

(D) Areas which are not to be powder coated but have metal inserts or enough structural integrity to be points of suspension should be utilized.

6.8.3 Powder Coating in a Single Coat Operation. If conditions are such that the part can be coated with 8 to 12 mils of the desired resin in one coat, than this is the preferred operation. Conditions allowing this include: components mass (heat retention), powder formulation, grain size, time between preheat and spraying and operator skill.

(A) Interior areas sharp corners and edges shall be coated first with the electrostatic voltage set at least half of that used for coating flat surfaces.

(B) Apply powder to the smooth or flatter surfaces of the component utilizing three criss-cross passes (horizontal-vertical-horizontal) in slow, even strokes. The most powder shall be delivered on the first pass with the voltage set at its highest. Due to a lessening of electrostatic attraction as thickness increases, it may be necessary to turn down the voltage to prevent the repelling of incoming powder. Repelling will result in localized powder clumps on the surface. If powder begins to fall off of the item, immediately cease coating that item and check for clumps.

(C) Powder clumps should be removed by blowing them off with an air gun. The area should then be carefully recoated.

(D) When coating a surface, the gun shall remain on. By continually releasing the trigger, an uneven stream of powder is blown towards the part. Whenever first depressing the spray gun trigger, the gun must be pointed away from the component to keep from depositing clumps of powder.

(E) Once all components are sprayed, they shall be returned to the oven immediately for complete curing (refer to Section 6.9).

6.8.4 Powder Coating in a Two-Coat Operation. If conditions are such that the part must be coated with 8 to 12 mils of the desired resin in two coats, then perform the following:

(A) Interior areas sharp corners and edges shall be coated first.

(B) Apply powder to the smooth or flatter surfaces of the component utilizing three criss-cross passes (horizontal-vertical-horizontal) in slow, even strokes. The most powder shall be delivered on the first pass with the voltage set at its highest. Due to a lessening of electrostatic attraction as thickness increases, it may be necessary to turn down the voltage to prevent the repelling of incoming powder. Repelling will result in localized powder clumps on the surface. If powder begins to fall off of the item, immediately cease coating that item and check for clumps.

(C) Powder clumps should be removed by blowing them off with an air gun. The area should then be carefully recoated.

(D) When coating a surface, the gun shall remain on. By continually releasing the trigger, an uneven stream of powder is blown towards the part. Whenever depressing the spray gun trigger, the gun must be pointed away from the component to keep from depositing clumps of powder.

(E) Return sprayed parts to curing oven for 5 minutes to gel the coating.

(F) Repeat 6.8.4.A-D.

(G) Return components to oven for complete cure (refer to section 6.9).

6.9 CURING

The coating is cured at the temperature specified by the resin manufacturer. Manufacturers provide a range of temperatures and time schedules. The operators should choose one that provides a complete cure in 10-20 minutes. Manufacturers' recommendations for utilizing variations of the standard cure schedules should be followed for components with complicated geometries. The heat transfer and retention rates of various areas on a part may cause irregular curing.

6.9.1 Cure Time. The parts should remain in the oven for the complete cure time if they are to be single coated or are in the second coat of a two-coat operation.

6.9.2 Cool Down and Coating Inspection. Upon curing, the parts are removed from the oven. The coating should be checked for brittleness or completeness of cure while still hot by tapping it with a metal object, such as a screw driver or putty knife. Allow the component to cool, then check coating thickness as specified in paragraph 4.6.

6.10 REWORK

Any component noted by the operators or SQCI as not having a satisfactory coating shall be dealt with according to the following.

6.10.1 Thin Coatings - Components with coating thicknesses below the 8 mil minimum shall be lightly abrasively blasted in the anchor-tooth blaster to impart a surface profile into the coating. The part should then be preheated for 15 minutes at the cure temperature and powder coated once according to Section 6.8.3 or 6.8.4, whichever the lead powder coating Petty Officer believes is best.

6.10.2 Thick Coatings - Excessively thick coatings must be removed or reduced by abrasive blasting. The removal of powder coating may be assisted by baking the part at 450°F for two to three hours, then cooling to ambient temperature prior to the abrasive blasting. Follow standard procedures beginning at Section 6.7.

6.10.3 Over Baked or Charred Coatings - Complete removal of the coating is required. Begin the entire process over at Section 6.5.

6.11 FINAL POWDER COATING THICKNESS INSPECTION

The SQCI officially performs this inspection, but the operators responsible for powder application should be aware of the results. The operators need to be familiar with any problem areas. Refer to Section 4.6 for inspection procedures.

6.12 FINAL ASSEMBLY

(A) Remove all masking and plugging material.

(B) Prepare the required installation kit (i.e., fasteners, anti-seize, sealant and instructions).

(C) Properly protect and package item for temporary stowage and transport to customer ship.

(D) The Shop Petty Officer in charge of production tracking and the SQCI shall agree to final product release.

(E) Remove metal identification tag, discard and re-attach Ship-to-Shop Tag.

(F) Remove Part 2 of Ship-to-Shop Tag and notify Shop Supervisor that item is ready for pickup.

(G) When Ship's Force picks up item, complete and attach Parts 1 and 3 of Ship-to-Shop Tag to Production Control Record.


SECTION VII

FEEDBACK

7.1 FEEDBACK INDICATIONS

In addition to the daily supervision of production and quality control, the following "feedback" indications will be used to monitor and maintain/improve the quality and productivity of the CC Shop:

- (A) Verbal and written reports from customer ships and shops.
- (B) Weekly analysis of the CC Shop's:
 - o Production input to output
 - o Labor and materials consumed
 - o PM/CM activity
 - o QC activity and results
 - o Product degradation/failure reports



**SHIP TO SHOP TAG
(GENERAL USE)**

TAG _____ OF _____

SURFGEN QA FORM 9090-4A (1/79)
S N 0116 LF 890 9020

(PART 1)

SHIP _____

JCN _____

EIC/APL _____ SER NO _____

JOB BRIEF/EQUIP NOMENCLATURE _____

LEAD W/C _____ DATE RECD _____ DELIVERED BY _____

ATTACH PART 1 AND PART 3 TO COMPLETED WORK REQUEST
AFTER PICK UP BY SHIP

READY FOR PICK UP TAG **(PART 2)**

SHIP _____

JCN _____

EIC/APL _____ SER NO _____

JOB BRIEF/EQUIP NOMENCLATURE _____

LEAD W/C REP. _____ DATE _____

CUSTOMER MATERIAL RECEIPT **(PART 3)**

SHIP _____

JCN _____

JOB BRIEF/EQUIP NOMENCLATURE _____

REC'D BY _____ DATE _____

DELIVERED BY _____ DATE _____

SHIP'S ENGINEER SHALL RETAIN THIS TAG (PART 3) AS RECEIPT
FOR MATERIAL DELIVERED TO THE TENDER.

Enclosure 1

CORROSION CONTROL SHOP POWDER COATING PRODUCTION CONTROL RECORD

USS _____

Ship	Hull Number
_____	_____
Job Control Number (JCN)	Production Control Number
_____	_____
Item Description	Location Deck Frame Side
_____	_____
TYPE COATING:	FINISH COLOR:
_____ Epoxy	_____ Haze Gray _____ Red
	_____ White _____ Black
	_____ Other _____

SECTION	PROCESS SEQUENCE	DATE	TIME	SHOP QCI SIGNATURE
1.	Receipt, Degrease			
2.	Masking			
3.	Rough Abrasive Blast			
4.	Anchor-Tooth Abrasive Blast 1-2 mils			
5.	Component Preheat 15 min. 30 min. 60 min. (circle one)			Attach Profile Tape Here
6.	Powder Spray, First Coat Operator Name _____			
7.	Gel 5 min.			
8.	Powder Spray, Second Coat			
9.	Final Cure Temp _____ Duration _____			
10.	Final Coating Thickness on all similar items in Work Order 8-12 mils			
11.	Final Assembly and Packaging			

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